NC STATE UNIVERSITY

Developing a Distance Education Lab Course in Plant Biology

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PB 200 - Plant Life

- Long-running general education course
- Mixed-majors
- Lecture and lab are inseparable

- Asynchronous DE offering developed to reach
  - Government employees
  - K-12 teachers
  - Students at institutions without general botany
  - NCSU students

Guiding Principles

- Must meet same learning outcomes as on-campus course
- Student interaction and feedback are important
- Lab must be as hands-on as possible
- Lab safety is paramount
- Develop multimedia tools to help visualize content

Course Development

- NCSU DELTA – IDEA Grant – 2010
- Year-long process in consultation with instructional designers and multimedia specialists
- Revisit specific outcomes for each lecture and lab topic
- Quality Matters Rubric
- Content delivered in Moodle

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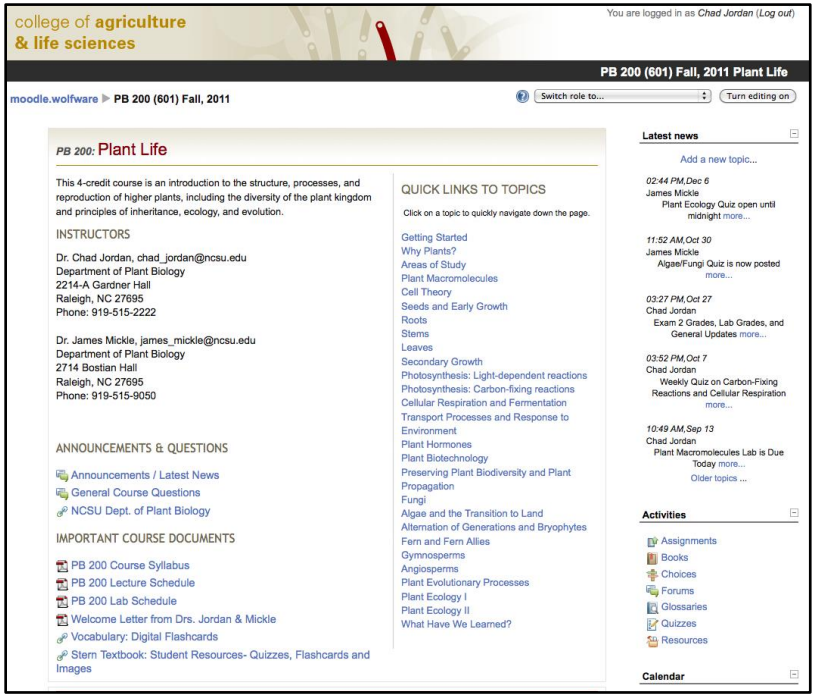
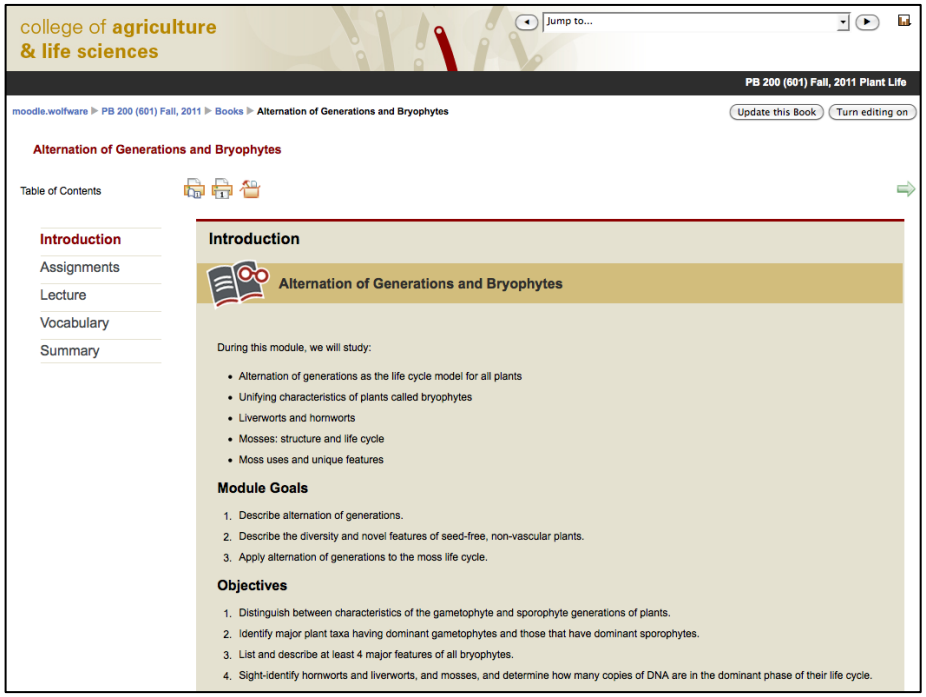
Course Enrollment

- First offered – fall 2011
- 85 total students in four semesters
- 12 Non-degree-seeking
  - Federal employees
  - Other institutions
  - Teachers
- 7 states
- 1 foreign country (Dubai)

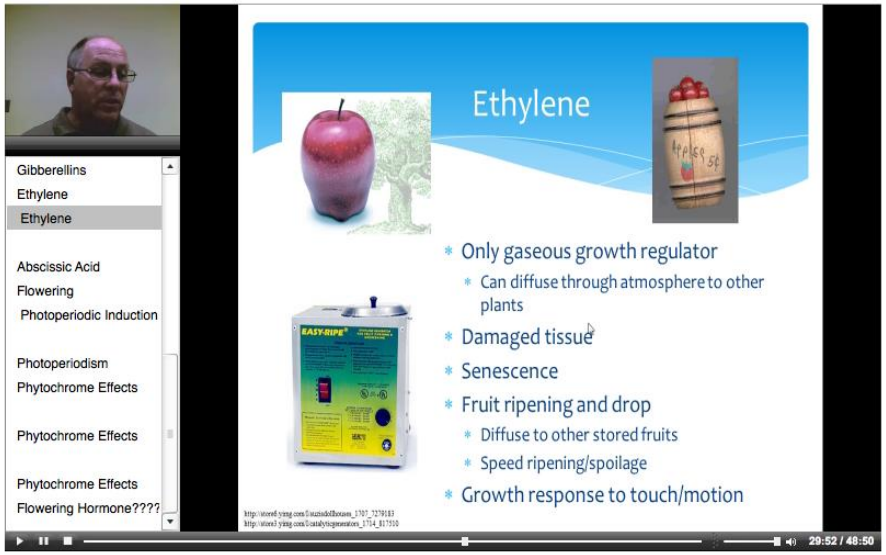
Course Moodle Site





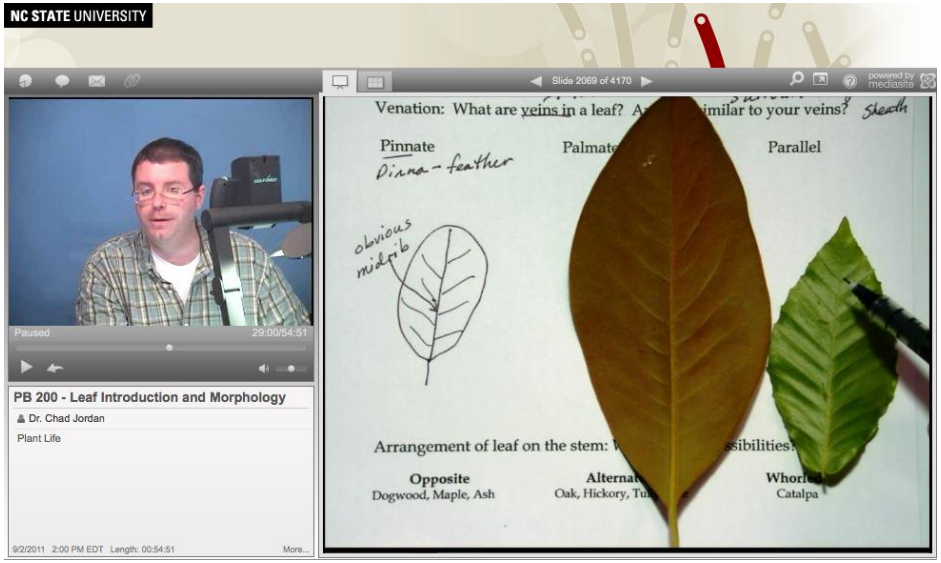
Extensive use of quick links and “Books” feature to organize lecture content.

Lectures



Lecture capture software used for PowerPoint-based presentations.

Mediasite with course pack notes.



Hands-on Labs

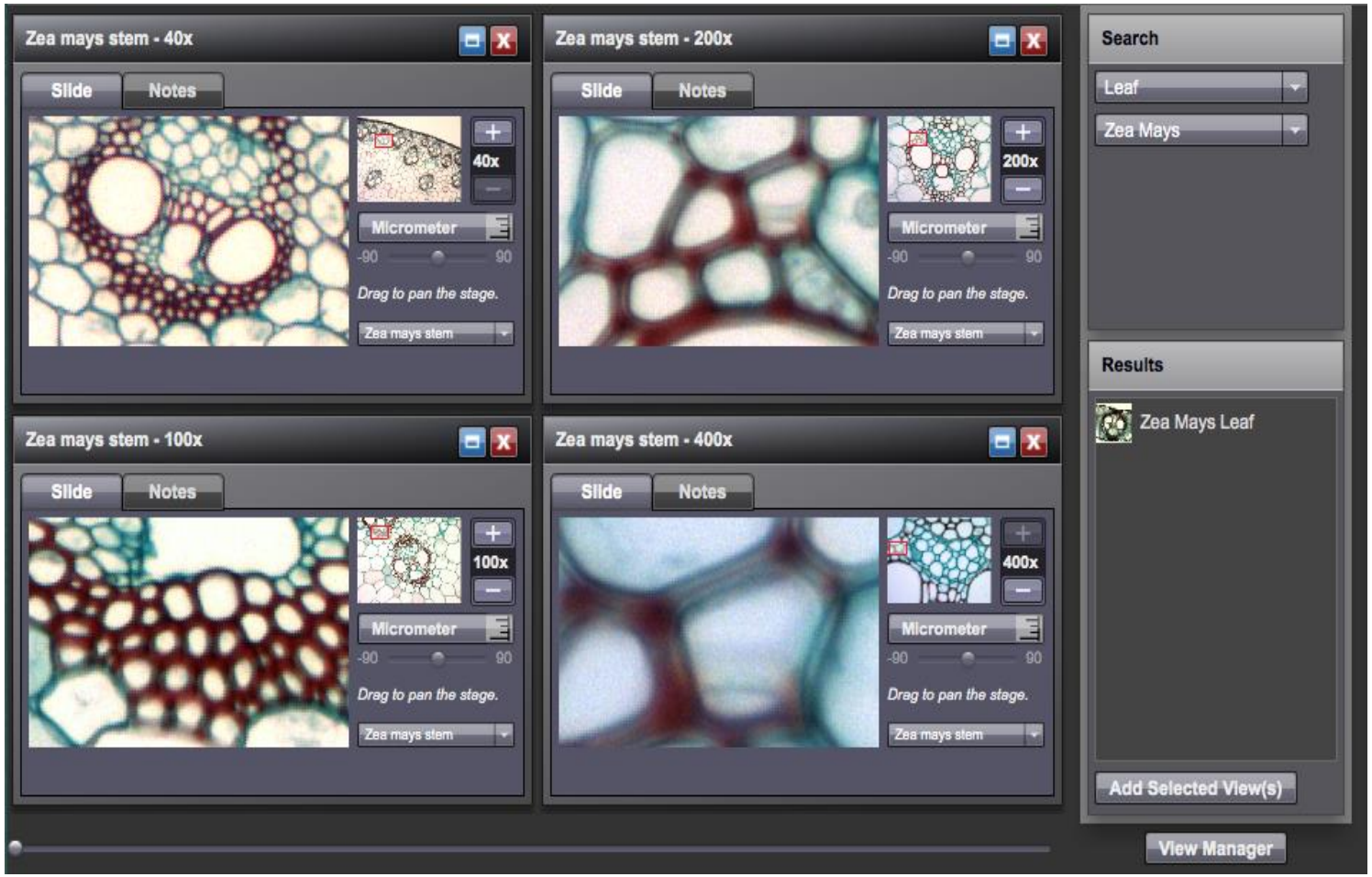
- Eight – adapted from on-campus course, but not identical
- Labs can be protracted for several weeks with regular monitoring
  - Plant Ecology
  - Growth and Development
- Primary focus on safety and practicality while addressing same course outcomes

Lab Kits

- Shipped or picked up
- List of materials required at home
- Students submit hard-copy write-ups and photographs
- Students sign safety statement

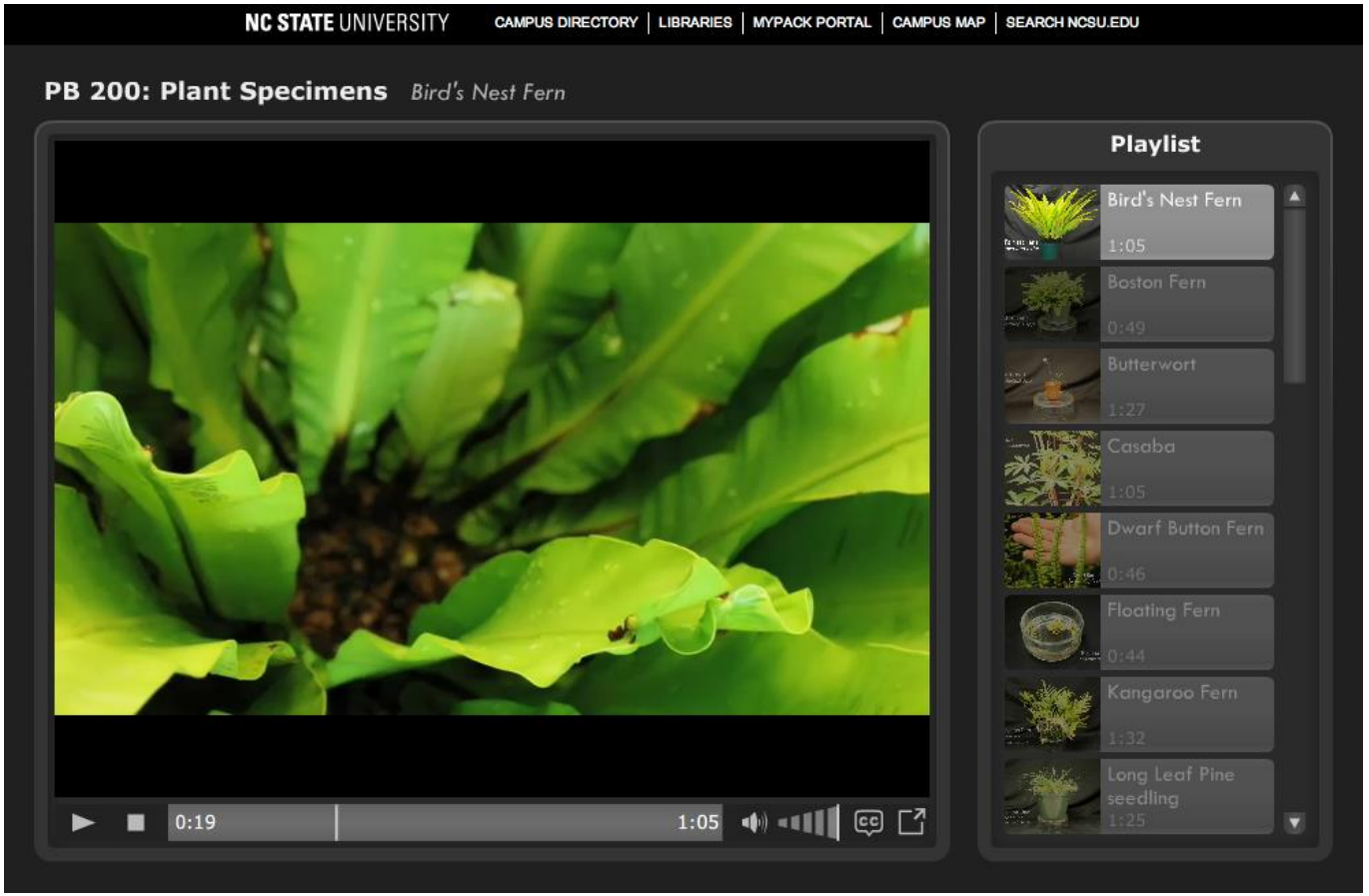
- Cost comparable to on-campus cost / student

Virtual Viewer



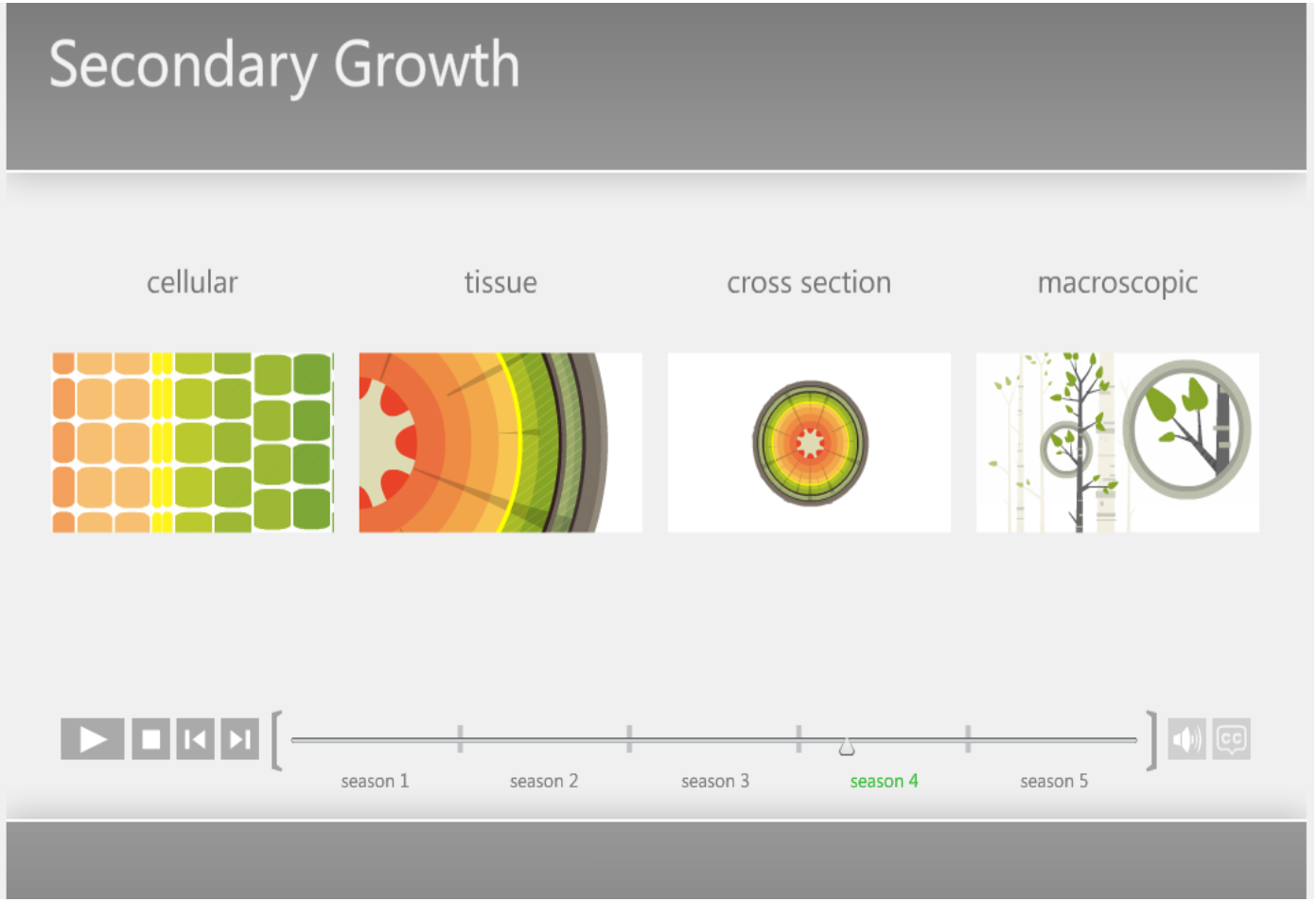
>40 slide specimens

Plant Diversity Videos



Also, herbarium tour video.

Secondary Growth Animation



Also now used in on-campus courses.

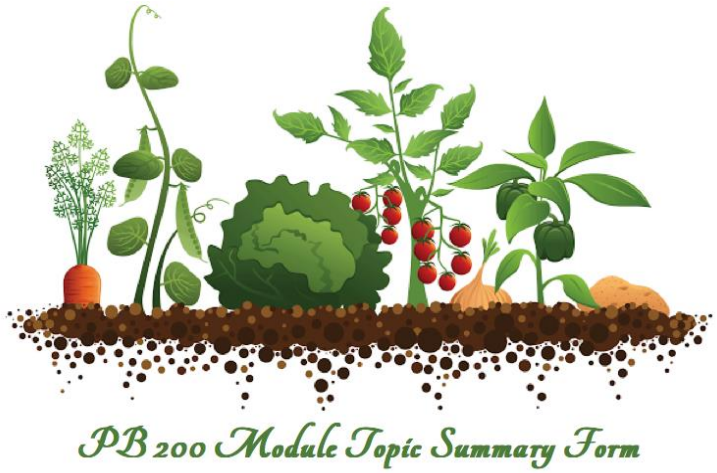
Student Perceptions & Feedback

- Students prefer Mediasite lectures over PowerPoint lecture capture
- Accessory multimedia well received
- Labs are popular, require careful planning

"The lab component to this course was wonderful. All of the lab materials that I needed were included in the kit and each of the lab instructions were clear and well explained. Any materials that I had to provide for the labs were ones that are everyday household materials I already had."

"Overall, this course was very well planned out and I enjoyed learning the material."

Module Topic Summary Feedback



PB 200 Module Topic Summary Form

As this module comes to a close, reflect on the topics studied and provide your feedback on the following questions. After entering your name and selecting the appropriate module, answer at least three of the five questions below. By doing so, you can award yourself up to 0.4 bonus points. You must provide thoughtful, detailed responses in order to receive bonus credit. Complete and submit this form by 11:55 PM on the last day of the module.

* Required

Last Name *

Last Name or Surname

First Name *

Given first name

What have YOU done to improve your learning skills in this class?

Choose ALL that apply.

- ☐ Completed the readings for the week.
- ☐ Reviewed all of the lecture material
- ☐ Studied the vocabulary.
- ☐ Asked the instructor for help if I did not understand.
- ☐ Posted a question in the General Course Questions.
- ☐ Other:

Rate yourself on the following (0 or .1). *

Remember, you must answer at least three of the above questions in order to award yourself bonus points.

	0	.1
I read the assigned readings for the week.	○	○
I was well rested and alert when studying the content and doing my assignments.	○	○
I participated in a group discussion and/or gave feedback to the instructor.	○	○
I asked questions and sought answers when they were needed.	○	○

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Using Google Forms

Some Lessons Learned

- Hands-on labs = a lot of development and refinement time
- Lab kit assembly is time-intensive each semester
- Students need guidance in a course with so many components
  - Short introductory video for each lab setup
- Approach not suitable for a *majors* lab course, where students develop tactile skills used in later courses

Acknowledgements

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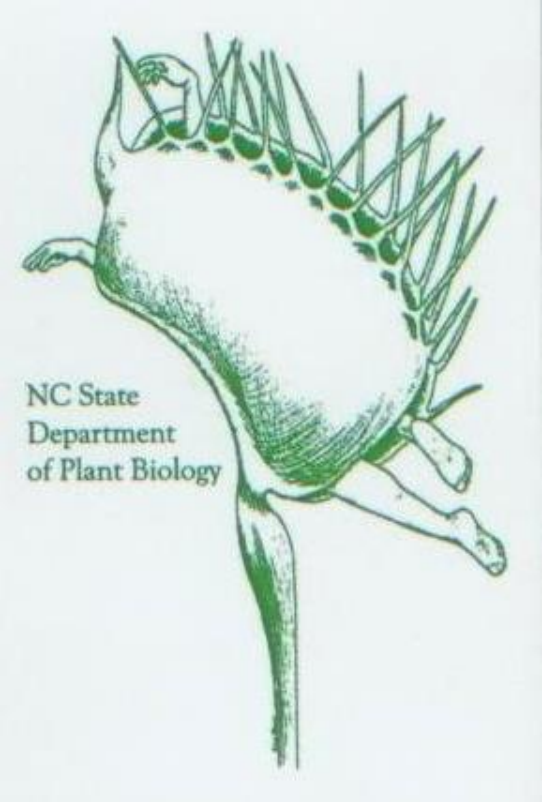

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References

- Bradley, L.K., Stutz, J.C., and Towill, L.R. 2009. Plant Biology: From the Classroom to the Internet. *Journal of Natural Resources and Life Sciences Education*. 38 (1): 82-86.

- Mickle, J. E. and P. M. Aune. 2008. Development of a Laboratory Course in Non-majors General Biology for Distance Education. *Journal of College Science Teaching*. 37 (5): 35-39.