

AQUATIC PLANTS AND THE ENVIRONMENT

Syllabus

SWES-474/574 ECOL-474/574 WFSc-474/574 (4 Units)

Fall 2004 - TR 1:00 to 3:50

Room [410 Koffler Building](#)

Course Web Site: <http://ag.arizona.edu/azaqua/aquaplants/aqplant.htm>

Course description: Aquatic plants are generally defined as those higher (vascular) plants completing their life cycles wholly or partly in a submerged state or in saturated soil. The course will cover aspects of the biology and ecology of aquatic vascular plants from freshwater (marsh and riparian) and estuarine environments. We will also examine environmental issues affecting wetlands, constructed wetlands, wetland management and legal issues surrounding wetlands. The course will include short field trips to constructed wetlands and local riparian zones during the class period and one Saturday field trip to a wetland in Arizona.

Instructors: Dr. Glenn, ph. 626-2664 and Chad King, ph. 626-2386

Instructors e-mail: eglen@ag.arizona.edu and chadking@ag.arizona.edu

Office Hours: T & Th 12:00 in Koffler 410, or by appointment at Environmental Research Lab

Text: [Wetlands 3rd Ed., Mitsch and Gosselink](#) (required)

Other readings will come from a variety of journals as well as from media sources. These sources will be posted to the website, with hard copies available at the SWES office, Shantz room 429.

Course Goals:

1. To understand physical, ecological and biological dynamics of wetland systems.
2. To understand the environmental issues affecting wetlands, including mitigation and implementation of restoration projects, constructed wetlands.
3. To identify common aquatic plants of Arizona, understand basic taxonomy and use of taxonomic keys.
4. To identify aquatic nuisance plant species, their environmental impacts and control efforts.
5. To identify and characterize wetlands of the world and associated aquatic plants.
6. To improve scientific writing skills through review and synthesis of primary literature.
7. To investigate wetlands research and restoration projects in Arizona and the southwest.

Assignments

1. First Paper

Objective: Groups of three to five students convey a holistic view of the physical, biological, hydrological and anthropological aspects of a specific wetland or type of wetlands by writing a series of papers and a giving a comprehensive class presentation.

Lab time will be given to form groups based on common interests. Groups will determine main topics facing that wetland and divide up areas of research to best cover all relevant material.

Each person will write a review paper on that topic. The review will draw from peer-reviewed literature, no gray literature (news articles, websites, etc). Writing and formatting should follow the format of the Wetlands journal (available at <http://www.sws.org/wetlands/#instauthors>). Papers should be clear and concise, from 8-10 pages in length. The final draft of the paper is **due 9/23**.

Papers will be redistributed for peer review by a classmate in another group. Reviewers will complete a 2-3 page review, using the handout on reviewers suggestions as a guideline. This review and the paper with editing comments is **due 9/30**.

A one page response by the author to the reviewer and the paper with changes incorporated to the professor is **due 10/7**.

Presentations will be developed by the group to effectively teach the rest of the class their knowledge on the particular wetland or type of wetland they studied. The presentation will be 45 min to one hour in length, with 10-15 minutes following for questions. The presentation should cover research papers and may include gray literature. Presentations will be worked into the course at appropriate times, beginning 10/21.

Grading on the papers will be 100 points for the paper, 50 for the review, 25 for the response to the reviewer, and 25 for the presentation.

2. Second Paper

474 – Review Paper

Students have a choice to do another review paper on a topic of their choice following the guidelines outlined above for the first paper. Topic examples include: wetland management, aquatic nuisance species (ANS) and management, specific wetland plant species, habitat destruction, constructed wetlands, the Colorado River delta, the history of Arizona wetlands, wetland response to forest fires, etc., etc. Topics must be cleared with the advisor by **10/19**. 474 students may also join with 575 students to complete the following:

574 – Graduate Research/Field Work/Internship and associated Paper

Project Objective: Students will collaborate with scientists at the University or with local management agencies, contributing to field research currently in process, or working to follow up on work that was done in the past. Collaborations will form with guest speakers to the class.

Or,

Wetland inventory and mapping projects.

Project Objective: Working in groups of 3-5, students will catalog and map the species at an Arizona wetland site to provide a baseline for future studies examining changes in habitat.

From the literature, students will design a methodology for systematically mapping and identifying the species present at the wetland site. This could include some or all of the following: plant identification and collection, plotting transects, measuring percent coverage, density, water flow, water quality, rainfall and evapotranspiration at/near the site, topography, etc. Tools available for use include: tests for nitrate, nitrite and ammonia nitrogen, phosphate; pH meters; DO meters; GPS units; thermometers; and other tools may be available on request.

The report/paper will show knowledge of topics such as the geology, land use, biotic changes, and reporting mechanisms of what is present at the site – study findings. A presentation to the class, with all group members participating, will clearly convey the methodology and results of the project.

The second papers are **due 11/18** (5 copies for research projects, 1 for review papers. They will be distributed to other groups for review. Two to three page reviews are **due 11/25**. One-page responses to the reviewer comments and one copy of the paper with corrections are both **due 12/7**. Presentations will be given to the class on **11/25, 12/2, and 12/7**. Copies of any presentation materials and any documentation of existing plants (plant collections, photo-documentation, etc from the wetland inventories studies) are **due on 12/2**.

Other ideas for research projects must be discussed with the professors for approval.

3. Lab and Field Trip Reports

The second and third hours of class will often be used for a variety of lab activities, discussion of current events, field trips to wetlands or guest speakers involved in managing or researching wetlands. There are three dates to turn in these reports (**9/16, 10/26, and 11/30**). No more than 4 reports will be accepted on any turn in day, so plan accordingly.

Reports will be due for:

- **1 herbarium report (50 pts)** – detailed drawings and descriptions of 10 plant species common to Arizona as seen in the herbarium collection.
- **2 of the guest speakers (2 X 30 pts)** – a one page synopsis of the speakers talk – you choose which speakers
- **2 lab reports (2 X 30 pts)** – one to two pages describing the lab objectives, methodology and a reflection on skills learned and their applicability
- **2 field trips (2 X 50 pts)** – one to two pages explaining the geology, hydrology and management of the site, recent impacts (natural and anthropological), identification and cataloguing of at least 5 plant species found at that site, and reflection on what the field trip helped you learn or made clearer.
- **1 current events review (30 pts)** – one page review of a current news article, please include the article or site the source. Comment on the scientific accuracy, the main problem presented, potential solutions, and its relation to the course and to more expansive environmental issues.
- **Optional: Substitution** for 60 pts worth of lab reports or current events review. Write a submission for the tree of learning web as described by Lisa Schwartz

4. Exams

There will be two in class exams and one open book take home exam. Exams will focus on materials covered since the last exam. While there will be no “comprehensive exam”, materials early in the semester serve as a building blocks for the materials that follow, so you may be asked about main topics throughout the course. Questions will come from lectures, guest speakers, textbook, labs, student presentations, handouts and field trips.

5. Class Participation

Much of the learning from this course comes from discussions during labs, field trips and during student presentations. Students who do not take part in these activities will be at a disadvantage to students who do take part in discussions and activities. Attendance is included in the class participation.

6. Interview with instructor

In order for the instructors to know you better so as to make the class best suit student interest, 25 points will be given for meeting with the instructor for 5-10 minutes during the first two weeks of class. Signup sheets will be available to best coordinate interviews.

Evaluation

Assignment	Value	Grading Scale
Papers (2 @ 225 each)	400	A : 90 – 100% : >1260 pts
Exams (3 @ 200 each)	600	B : 80 – 90% : 1120-1259 pts
Lab Writeups	300	C : 70 – 80% : 980 – 1119 pts
Class Participation	75	D : 60 – 70% : 840 – 979 pts
Interview with Instructor	25	F : <60% : <839
Total	1400	

There will not be a curve.

Late Policy:

An assignment that is handed in late will be reduced in value 10 percent per day late.

Participation Policy:

All students are expected to be present for each class and to remain current with the readings. Part of the grade is also dependent on class participation.

Incomplete Grade Policy:

Incomplete grades will follow the university policy (see <http://catalog.arizona.edu/2003-04/policies/grade.htm#1>)

Academic Integrity

All students enrolled in this class will be expected to adhere to high standards of conduct and integrity as outlined in the University of Arizona Student Code of Conduct and Code of Academic Integrity. The codes can be found at <http://studpubs.web.arizona.edu/policies/cacaint.htm>.

Special Needs and Accommodations

Students needing special accommodations or special services should contact the Learning Disabilities Program/SALT, Old Main Bldg., Room 117 (621-1242) and/or the Center for Disability Related Resources/CDDRR, Second and Cherry Streets (621-5227). The needs of specialized services must be documented and verified by one of these units. We will do everything we can to accommodate all students to enhance their learning experience, but we must know of special circumstances in advance.

Topical Outline

Tentative Schedule, may be subject to change.

Date	Lecture	Topic	Lab	Reading	Assignments Due
8/24	1	Introductions - Overview		Chap 1-2	
8/26	2	Definitions of Wetlands - Wetlands of the World	Current Events	2,3	
8/31	3	Wetlands of North America		4	
9/2	4	Biological Adaptations	Wet Lab	7	
9/7	5	Biological Adaptations	Herbarium	7	
9/9	6	Tidal salt marshes	Herbarium	9	
9/14	7	Mangrove Swamps	Ann Phillips	11	
9/16	8	Tidal Freshwater Marshes		10	
9/21	9	Exam 1			1 st Lab Reports Turn In
9/23	10	Agua Caliente – Sabino - La Cebadilla	Field Trip		1 st Paper Due
9/28	11	Freshwater Marshes	Current Events	12	
9/30	12	Case Study - Everglades	Lisa Schwartz		Review Due
10/5	13	Peatlands		13	
10/7	14	CERF – Tres Rios – Santa Cruz	Field Trip		Response and Paper Due
10/12	15	Swamps and Riparian Forests		14,15	
10/14	16	Case Study: Colorado River			Take Home Exam Assigned
10/19	17	Constructed Wetlands	Dave Walker	20	Take Home Exam Due
10/21	18	Wetland Laws and Protection		18	
10/26	19	Classification, Inventory, and Delineation		21	Student Presentations
10/28	20	Exotic and invasive species	Ed Vasquez Sangho Choi		2 nd Lab Reports Turn In
11/2	21	Case study: saltcedar			Student Presentations
11/4	22	Environmental Issues: case studies (e.g., dead zone)			Student Presentations
11/9	23	Remote sensing and other tools for wetland studies			Student Presentations
11/11	24	San Pedro	Field Trip		
11/16		<i>Veteran's Day</i>	<i>No Class</i>		
11/18	25	Temporal Wetlands			2 nd Paper due (5 copies)
11/23	26	Wetlands Management			
11/25	27	Grad Student Presentations			2 nd Paper Review due
11/30		<i>Thanksgiving Holiday</i>	<i>No Class</i>		
12/2	28	Grad Student Presentations			3 rd Lab Reports Turn In
12/7	29	Grad Student Presentations			2 nd Paper Response and Paper
12/9		Dead Day			
12/16		Final Exam (2-4 pm)			