# BIOL 361/561 WATER 361/561 Aquatic Invertebrate Zoology

Fall 2012

Lectures MW 12:00-12:50 PM, SCI A107

Labs M 1:00-2:50, 3:00-4:50 PM TNR 460


| | | | |
|---|---|---|---|
| Instructor: | Dr. Daniel L. Graf | Course web site: | Desire2Learn site at http://mypoint.uwsp.edu |
| Office: | TNR 335 | | |
| Phone: | 715.346.2285 | | |
| email: | dgraf@uwsp.edu (include "BIO 361" in subject) | Office Hours: | T Th F 9-11 AM or by appointment |


**General Course Description.** "Classification, structure, and life history of lotic and lentic freshwater invertebrates (exclusive of insects and parasites) with emphasis on Wisconsin species."

**Objectives.** The objective of this course is to survey the diversity of the invertebrate animal taxa that occur in freshwater by comparing the body-plans, life histories, and ecologies of representative species.

*Course Objectives:*

Your instructor will:

1. Review the diversity of the invertebrate animal taxa that occur in freshwater.
2. Compare and contrast variation in morphology and ecology across taxa in the context of grades of morphological complexity, ecological interactions, and evolutionary relationships.
3. Provide hands-on experience with living and preserved organisms, including species known to occur in Portage County and Wisconsin, generally.
4. Provide instruction on effective writing skills using invertebrate animals as a vehicle for discussion.
5. Emphasize the relevance of invertebrate zoology to human health and happiness.

*Learning Outcomes:*

You will be able to:

1. Differentiate and classify animal diversity.
2. Describe the variety of invertebrate animal body-plans, ecologies, life histories, and reproductive modes in the context of your own vertebrate experience.
3. Synthesize a large body of knowledge, including a vast terminology.
4. Demonstrate critical and independent thought through writing.
5. Acquire experience with the primary literature.

**Prerequisites.** Courses in Introductory Biology (BIOL 101 or 160).

**Required Materials.** *Pennak's Freshwater Invertebrates of the United States*, 4th edition (2001), by Douglas G. Smith. John Wiley & Sons, Inc., New York (ISBN 0-471-35837). This book is available for rental at the bookstore.

**Exams, Assignments, and Grading.** Your final grade for the course will be based upon 350 possible points.

| **BIOL 361** | **points** |
|---|---|
| Exam 1 | 50 |
| Exam 2 | 50 |
| Final Exam | 100 |
| Daily Quizzes | 50 |
| Lab Exercises | 50 |
| Bibliography | 25 |
| Final Paper | 25 |
| **TOTAL** | **350** |

There will be three exams that constitute about 57% of your final grade: two during the term (50 points each) and a comprehensive final (100 points). The exams will be designed to test your mastery of the material as well as your ability to use critical-thinking skills to apply that knowledge. The exams may include matching, multiple choice, short-answer or essay type questions. All three exams will also include a "digital practical" component, wherein images of taxa, structures, etc. will be projected on the screen to be identified or explained.

NOTICE that the two "regular" exams will be given during scheduled lab periods (TNR 460).

In addition to periodic exams, daily 2-point quizzes will take place at the beginning of each lecture period. All questions will be "short answer," and topics from preceding lectures *as well as the lecture scheduled for that day* are fair game. Any daily quiz points acquired after 50 are "bonus" points. Daily quizzes will constitute roughly 14% of your final grade.

The remainder of the points will come from the laboratory exercises (14%) and your writing assignments (14%), described below.

Grades will be based upon the following percentages of the course total:

| | | | | | |
|---|---|---|---|---|---|
| | | 100-94% | A | 93-89% | A- |
| 88-87% | B+ | 86-83% | B | 82-79% | B- |
| 78-77% | C+ | 76-73% | C | 72-69% | C- |
| 68-67% | D+ | 66-63% | D | 62-59% | D- |
| <58% | F | | | | |

**REQUESTS FOR EXTRA POINTS WILL NOT BE HONORED.**

**Exam and Quiz Rules.** The following rules apply to exam periods as well as quizzes.

- If you arrive so late for an exam that anyone else has finished and left, you will not be allowed to take the exam at that time. You may be able to take a make-up exam (see attendance policy below).
- If you arrive late for a quiz or exam, you will not be given extra time. When the rest of the class is finished, you will need to be done. There are no make-up quizzes.
- All exams, quizzes, lab exercises, etc. must be completed in black or blue ink or pencil.
- MP3 players, cell phones, etc. will not be allowed in the testing area.
- There may be multiple exam forms: same questions, different order.

**Laboratory.** Laboratory sessions are your opportunity to get hands-on experience with exemplar species of the taxa we are discussing in lecture. For many labs, live animals will be available for observation.

YOU MUST DRESS APPROPRIATELY FOR LAB. The same lab safety rules for other Biology courses apply for BIOL/WATER 361. We will be working with ethanol- and formalin-preserved materials as well as sharp objects like dissecting blades and (potentially broken) glass.

- You MUST wear shoes — not sandals, flip-flops, or other options that do not protect your feet.
- It is recommended that you wear clothes that you won't mind getting grubby.
- FAILURE TO COMPLY WILL RESULT IN YOUR REMOVAL FROM LAB UNTIL YOU ARE PROPERLY ATTIRED.

At each lab period, you will receive a handout detailing the material available for examination as well as instruction as to what you should be looking at. You should make drawings and take notes as necessary in order for you to be able to answer the "digital practical" questions on the exams. You will turn in your lab notes at the end of each lab period to be graded for completeness. These will be returned by the following Wednesday lecture.

**Writing Assignments.** Writing assignments will contribute a substantial portion of your final grade (14%). You will complete a term paper that will be evaluated in two phases.

- Annotated Bibliography due on 31 October 2012 (25 points).
- Final Paper due on 12 December 2012 (25 points).

Instructions and information about grading will be provided in separate hand-outs.

In addition to your instructor's office hours, the Writing Lab at the UWSP Tutoring-Learning Center is available to help you.

http://www.uwsp.edu/tlc/Pages/writingReadingTutorials.aspx

**Attendance.** YOUR COMMITMENT TO YOUR CLASSES IS AMONG THE MOST IMPORTANT THINGS IN YOUR LIFE RIGHT NOW. You are expected to attend all lecture and lab sessions. Absences relating to a student's religious beliefs will be accommodated according to UWS 22.03 (URL below), providing the student notifies the instructor within the first 3 week of classes regarding the specific dates she/he will be absent.

http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap22.pdf

**Make-Up Exams.** You must make every effort to take exams at the scheduled times. MAKE-UP EXAMS WILL BE ALLOWED IN CASES OF MEDICAL EMERGENCY, FOR WHICH YOU MUST PROVIDE WRITTEN DOCUMENTATION. You must make arrangements with Dr. Graf within 24 hours of the exam to schedule a make-up exam within one week or you will forfeit the points.

- An emergency is a situation where your presence is required to alleviate extreme suffering (including but not limited to your own).
- Scheduled appointments aren't emergencies.
- A good rule of thumb: *If your situation wouldn't cause you to postpone your wedding, then it isn't a good reason to miss a scheduled exam.*

**Academic Integrity.** Any misrepresentation of your work, including plagiarism, or cheating on exams will result in a zero (0) being recorded for that activity. Students are encouraged to become familiar with and understand the UWS/UWSP Student Academic Standards and Disciplinary Procedures governing student academic conduct. This is available for download at:

http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap14.pdf

- Copying whole passages written by someone else is plagiarism. Even if you right-click in Word to use the thesaurus and replace some words.
- Cobbling together sentences from various sources and presenting them as your own is plagiarism.
- Quoting passages is not appropriate in this class. Use your own words.

Reminder: DR. GRAF IS NOT AS DUMB AS YOU THINK HE IS.

**Classroom Conduct.** Student and instructor behavior should promote an environment favorable to both teaching and learning. It is disruptive to come late to class, read extra-curricular media in class, or use cell phones (and other electronic devices) during class time. Students that choose to disrespect their classmates and their instructor by disrupting lectures or labs will be asked to leave.

**Disabilities.** Students with disabilities are welcome and encouraged in this class. Students with disabilities should contact the Disability and Assistive Technology Center during the first two weeks of the semester if they wish to request specific accommodations.

http://www.uwsp.edu/disability/Pages/default.aspx

| wk. | date | # | topic | textbook | lab |
|---|---|---|---|---|---|
| 1 | 3 Sept. | – | LABOR DAY (no classes) | | none |
| | 5 Sept. | 0 | Welcome! Introduction & Syllabus | — | |
| 2 | 10 Sep. | 1 | Introduction to Animals | Ch. 1 | Microscopy & Preview of Organisms |
| | 12 Sep. | 2 | Classification of Animals | Ch. 1 | |
| 3 | 17 Sep. | 3 | Porifera | Ch. 2 | Invertebrate Sampling Methods (Schmeeckle Reserve) |
| | 19 Sep. | 4 | Cnidaria | Ch. 3 | |
| 4 | 24 Sep. | 5 | Platyhelminthes | Ch. 4 | Porifera, Cnidaria & Platyhelminthes |
| | 26 Sep. | 6 | Nemertea & Gastrotricha | Ch. 5-6 | |
| 5 | 1 Oct. | 7 | Rotifera | Ch. 7 | Nemertea, Gastrotricha & Rotifera |
| | 3 Oct. | 8 | Nematoda & Nematomorpha | Ch. 8-9 | |
| 6 | 8 Oct. | 9 | REVIEW | — | **Exam 1** |
| | 10 Oct. | 10 | Ectoprocta & Entoprocta | Ch. 11-12 | |
| 7 | 15 Oct. | 11 | Intro to the Annelida | Ch. 13 | Rotifera, Nematoda, Nematomorpha & Ectoprocta |
| | 17 Oct. | 12 | Oligochaeta & Hirudinea | Ch. 13 | |
| 8 | 22 Oct. | 13 | Intro to the Mollusca | Ch. 14 | Annelida |
| | 24 Oct. | 14 | Gastropoda | Ch. 14 | |
| 9 | 29 Oct. | 15 | Bivalvia | Ch. 14 | Mollusca |
| | 31 Oct. | 16 | Intro to Arthropoda<br>**Bibliography DUE!** | Ch. 16 | |
| 10 | 5 Nov. | 17 | Tardigrada | Ch. 10 | Arthropoda & Related Phyla |
| | 7 Nov. | 18 | Arachnida | Ch. 15 | |
| 11 | 12 Nov. | 19 | REVIEW | — | **Exam 2** |
| | 14 Nov. | 20 | Branchiopoda | Ch. 17-18 | |
| 12 | 19 Nov. | 21 | Copepoda & Branchiura | Ch. 19-20 | Branchiopoda |
| | 21 Nov. | 22 | TBA | — | |
| 13 | 26 Nov. | 23 | Ostracoda | Ch. 21 | Microcrustacea |
| | 28 Nov. | 24 | Malacostraca & Decapoda | Ch. 22, 25 | |
| 14 | 3 Dec. | 25 | Isopoda & Amphipoda | Ch. 23-24 | Malacostraca |
| | 5 Dec. | 26 | Deuterostomes | — | |
| 15 | 10 Dec. | 27 | Freshwater Invertebrate Evolution | — | Review Activity |
| | 12 Dec. | 28 | REVIEW<br>**Term paper DUE!** | — | |
| 16 | 19 Dec. | – | **Final Exam (2:45-4:45 PM)** | | |