

**ZOOL 4420: Invertebrate Zoology**  
**California State University Stanislaus**  
**Course Syllabus Fall 2019**

**Instructor:** Dr. Ritin Bhaduri

**Phone:** (209) 667-3485

**Office Hours:** Tuesday & Thursday: 1:00 – 2:00 PM, or by appointment.

**Office:** 263 Naraghi Hall

**Email:** rbhaduri@csustan.edu

**Lectures:** Tues & Thur: 9:30 AM – 10:45 AM in Rm. N221; **Lab:** Tues: 2:00 – 4:50 PM in Rm N210

**Text:** *Living Invertebrates*. Vicki Pearse, et al. Blackwell Scientific Publications (optional).

**Announcements:** This course will use Moodle for lecture slides, article links, grades, etc. You need to enroll yourself in our course by (1) logging into <http://moodle.csustan.edu> with your CSUS id name (“jbond” if your email address is “[jbond@csustan.edu](mailto:jbond@csustan.edu)”) and password. (2) Then, click in the “Course Categories” menu to select the current term and then click on our course name. (3) Finally, you must supply an enrollment key to join the course. The enrollment code is **zool4420fa19**

**Introduction:** Invertebrates comprise at least 95% of all known animals. From their numbers and diversity alone, it is obvious that invertebrates are incredibly important. They are food for humans and other animals, they cause disease, they pollinate most of the plants we need and use, they affect global climate, some are important with respect to medicine, etc. All people, but especially biologists, need to have a good working knowledge of invertebrates.

**Teaching Philosophy:** My teaching philosophy is that I want to share as much knowledge and understanding of the subject with students as possible. To see my students excel and become empowered with the newly acquired knowledge is what I feel teaching is all about. My goal for this course is that all participants learn about and come to appreciate all invertebrate groups. In more detail, this involves learning names and classification, and biology of invertebrates.

**Course Description:** Invertebrate Zoology is a senior-level animal diversity course. It is a 4-unit lecture and laboratory course, with 3 lectures and 1 lab period per week. It satisfies the Biology degree diversity requirement, is an elective in Biology, is an option in the Zoology concentration, is an option in the Ecology and Field Biology concentration, and is a requirement for the Marine Biology concentration.

**Specific Course Objectives**, i.e., what should you be learning: This is a content-heavy course; the primary learning objective is therefore mainly to learn course content. You need to learn thoroughly the information presented in lecture and lab about invertebrates, including being able to synthesize, organize and summarize such information into coherent thought processes. You need to be able to correlate what you see in lab with lecture materials.

**ASSESSMENT METHODS, GRADES and GRADING:**

**Exams:** There will be three regular exams and a final exam. The final exam will not be comprehensive; it will only include new material covered since Exam 3. Lecture exams will consist of multiple choice questions only. You will need a scantron form for all exams (Form # 882-E). Requests for early exams must be submitted *in writing* to the instructor prior to the scheduled exam. You will need to provide

written (documented) evidence of hardship. **No makeup exams will be given after graded exams are returned to the class.**

| Assessment   | Percentage  | Grading Scale   |
|--------------|-------------|---|
| Exam 1       | 17          | A = 90% or higher (A- = 90-92, A = 93 and higher)<br>B = 80 – 89% (B- = 80-82, B = 83-86, B+ = 87-89)<br>C = 70 – 79% (C- = 70-72, C = 73-76, C+ = 77-79)<br>D = 60 – 69% (D- = 60-62, D = 63-66, D+ = 67-69)<br>F = below 60%<br><b>Note:</b> CR/NC is not an option in this course. |
| Exam 2       | 17          |   |
| Exam 3       | 17          |   |
| Exam 4       | 17          |   |
| Lab Exams    | 22          |   |
| Seminar      | 10          |   |
| <b>Total</b> | <b>100%</b> |   |

A lab notebook is optional but worth up to 5% extra credit. Lab notebooks are due on final exam day. Notebooks will be graded on the basis of the number of YOUR drawings (not Xeroxes, digital photos, etc.) and thoroughness of labeling of all drawings.

**Cheating and Plagiarism:** Don't do it! Your work should reflect your own effort and words. Any verified instance of cheating and/or plagiarism will be unpleasant for all involved.

#### Important Dates:

- Aug 22 – Classes Start
- Sept 19 – Census Date
- Oct 8 – Non-instructional Day
- Nov 28 – 29: Thanksgiving Break
- Dec 10 – Last day of classes

#### EXPECTATIONS OF STUDENTS

1. Attend all class meetings. If you must miss a class meeting, it is your responsibility to make up any work missed and to obtain and learn all information you missed.
2. Be on time to class and stay in lab until it is supposed to be over.
3. Students are expected to take exams on days and times listed in the class schedule. There are NO alternatives for lab exams. If you have a legitimate excuse to miss a lecture exam, the instructor needs to know, before the beginning of the exam time, and other arrangements need to be made prior to the exam time. Additionally, you should be prepared to provide documentation (doctor's note, etc.) for missing a lecture exam.
4. All exams will be held during the lab period. If you are tardy, you will not be given extra time to finish the exam. Potty breaks are not allowed during exams. **Once exam has started, you will not be allowed to leave the room until you have finished and turned in your exam.**
5. Cheating in any form is unacceptable in science, including in all biology classes. This includes Zoology 4420. It is the policy of the Department of Biological Sciences that anyone caught

cheating will receive a grade of F for the course. The instructor reserves the right to request any student even suspected of cheating to take a second, different, exam from the rest of the class.

6. Participate fully and in a positive manner in all class activities.

7. Talking, whispering, and giggling among students during lectures is disruptive for both classmates and the instructor. It is expected that students will refrain from these activities while anyone is lecturing at any time during lecture or lab time. If this becomes a problem, students will be asked to leave class for the duration of these activities.

8. Observe lab safety and cleanliness procedures. Please clean up after every lab.

9. Cell phones must be turned off during lecture or lab time. Cell phones PDA's, head phones, palms, etc. must be turned off, and must be placed out of sight of any student in the class, during all lecture and lab exams.

10. People learn best when they take responsibility for their own learning. You need to accept that responsibility.

*It is my hope and expectation that we will all work together to make this course an outstanding experience for all involved.*

**Study Skills:** The following suggestions may help you succeed in this and other classes.

1. **Read** the lectures before class and bring questions you have to class.

2. **Attend** class.

3. **Take notes** in a way that is intuitive to you, even if you have to use a lot of paper.

4. **Join a study group** with likeminded individuals. Students who study in groups tend to do better than those that study alone.

5. **Study** for the exams sooner than the night before or morning of the exam.

6. **Go to bed early** the night before and get up early the day of exams.

7. **Learn how you learn** and then stick with a style or process that is successful for you.

8. Learning takes time and is difficult (impossible?) to do in a single session before an exam. **Form a study group that meets regularly** so you can talk about new concepts and review terminology with your colleagues. When studying for exams, focus primarily on lecture notes, concepts emphasized in class, and any assigned readings.

## LECTURE & LAB SCHEDULE (Tentative)

| Week of  | Topics   |
|----------|--|
| Aug. 20  | Course Introduction, Classification, Habitat     |
| Aug. 27  | Protozoans                                       |
| Sept. 3  | Phylum Porifera                                  |
| Sept. 10 | Phyla Cnidaria and Ctenophora                    |
| Sept. 17 | <b>Exam 1;</b> Acoelomates                       |
| Sept. 24 | Pseudocoelomates                                 |
| Oct. 1   | Phylum Annelida & Allied Taxa                    |
| Oct. 8   | Introduction to Phylum Arthropoda; <b>Exam 2</b> |
| Oct. 15  | Trilobites, Chelicerates                         |
| Oct. 22  | Crustacea, Insecta and others                    |
| Oct. 39  | Coelomate Protostomes                            |
| Nov. 5   | Coelomate Protostomes; <b>Exam 3</b>             |
| Nov. 12  | Minor Phyla                                      |
| Nov. 19  | Phylum Mollusca                                  |
| Nov. 26  | Phylum Echinodermata                             |
| Dec. 3   | Invertebrate Chordates                           |

**Field Trip** (*Optional, via personal vehicles*): **November 26 (Tue.)**, 1:00–7:00 pm.  
We will visit Monterey Tide Pools (Low tide: 4:30 pm).

**Final Exam: Tuesday, December 17: 8:30 – 10:30 am in N210**

### Schedule of Student Seminars & Guidelines

- Refer to the sample presentation (posted on Moodle) before preparing your talk.
- Pick three papers on your topic by visiting scholar.google.com and searching the papers using strong keywords. You MUST consult your instructor on which paper you decide to present and get that paper **approved** by your instructor prior to preparing for your presentation.
- Your seminar should have the following sections: Title, Introduction (with pictures), Materials/Methods (outline), Results (data, graphs), and Discussion/Conclusion.
- Follow the example of the seminar posted on the course homepage on Moodle.
- Use bullet points on your PPT slides. Avoid excessive reading from slides.
- Your presentation will be held during the laboratory period and should last for ~15 min, followed by 5 minutes for questions.
- Try your best to make your presentation as interesting as possible.

| Presenters | Topics                         | Dates (Tentative) |
|------------|--------------------------------|-------------------|
|            | Porifera                       | Sept              |
|            | Cnidaria: Scyphozoa or Cubozoa | Sept              |
|            | Platyhelminthes: Trematoda     | Oct               |
|            | Platyhelminthes: Cestoda       | Oct               |
|            | Nemertea                       | Oct               |
|            | Rotifera                       | Oct               |
|            | Nematoda                       | Oct               |
|            | Acanthocephala                 | Oct               |
|            | Annelida                       | Oct               |
|            | Arthropoda: Crustacea          | Nov               |
|            | Arthropoda: Insecta            | Nov               |
|            | Molluska                       | Nov               |
|            | Echinodermata                  | Dec               |

#### Oral Presentation Evaluation Form

Presenter: \_\_\_\_\_

Seminar Title: \_\_\_\_\_ Total Points: \_\_\_\_/50

#### I. Style

\_\_\_\_\_ The talk fits the time limit. (Note: Presentations are ~15 minutes excluding questions.)

Presentations outside the target time lose 5 points.

\_\_\_\_\_ Enough time is spent on each slide to allow the audience to absorb the information.

\_\_\_\_\_ The visuals have large and concise text and are readable by all audience members. Use bullets.

\_\_\_\_\_ Information in tables and figures are readable by all audience members.

\_\_\_\_\_ The talk is **NOT** read. 5 – 10 points will be deducted if the talk is read.

\_\_\_\_\_ The flow, message, and length of the talk indicate the speaker practiced the talk.

\_\_\_\_\_ The presentation can be clearly heard by all audience members and there are no distracting mannerisms.

## **II. Content**

\_\_\_\_\_ The guiding question/message of the talk is stated at the beginning. Include a title slide.

\_\_\_\_\_ Information presented is appropriate for a scientific audience.

\_\_\_\_\_ The introduction is brief in proportion to the length of the talk.

\_\_\_\_\_ Methods are shown in with sufficient detail to support the results.

\_\_\_\_\_ The format of each table/figure is described before focusing on the content.

\_\_\_\_\_ Relevant findings in figures and tables are adequately described.

\_\_\_\_\_ Clear and concise conclusions are stated at the end in a form to reinforce the message.

\_\_\_\_\_ The presenter appears to understand the material.

\_\_\_\_\_ The presenter handles questions well.

\_\_\_\_\_ The presenter appears to have more knowledge of subject (as evidenced by handling of questions) than given in presentation.

\_\_\_\_\_ The information from different articles (sources) is integrated. Include a bibliography slide.

Overall Comments:

# OCTOPI WALL STREET



**Invertebrates are 97% of animal diversity!**

*Brought to you by Oregon Institute of Marine Biology, University of Oregon*