

ZOO 4204C SCHEDULE – FALL 2005 Prof. W. Herrnkind; Asst. Instr., P. Bouwma

DAY/DATE	PLACE	ACTIVITY (FSUML – meet van in front of CON @ ~0900)
T – Aug. 30	232 CON	Introductory Lecture & Course Plan
R – Sept. 1	FSUML	Field Survey of Coastal Marine Habitats & Organisms, especially Crustacea, Mollusca, Echinodermata Boat
T – Sept. 6	FSUML	B
R – Sept. 8	FSUML	Lectures on I. Science Inquiry Process and II. Crustacea
T – Sept. 13	FSUML	Preparation for Project #1 (Crustacea)
R – Sept. 15	FSUML	Project #1
T – Sept. 20	FSUML	Project #1
R – Sept. 22	FSUML	Project #1
T – Sept. 27	FSUML	Project #1
R – Sept. 29	FSUML	Project #1 Concludes
T – Oct. 4	FSUML	Oral Reports (AM); Lecture: Mollusca (PM) <i>Written Reports- Crustacea due Tuesday, Oct. 11.</i>
R – Oct. 6	FSUML	Preparation for Project #2 (Mollusca)
T – Oct. 11	FSUML	Project #2 (Report 1 due)
R – Oct. 13	FSUML	Project #2
T – Oct. 18	FSUML	Project #2
R – Oct. 20	FSUML	Project #2
T – Oct. 25	FSUML	Project #2 Concludes
R – Oct. 27	FSUML	Oral Reports (AM); Lecture: Echinodermata (PM) <i>Written Reports- Mollusca. due Thursday, Nov. 3.</i>
T – Nov. 1	FSUML	Preparation for Project #3 (Echinodermata) B
R – Nov. 3	FSUML	Project #3 (Report 2 due) B
T – Nov. 8	FSUML	Project #3 B
R – Nov. 10	FSUML	Project #3 B
T – Nov. 15	FSUML	Project #3 B
R. – Nov. 17	FSUML	Project #3 Concludes B
T. – Nov. 22	FSUML	Oral Reports; Written Reports -Echinod. due Thur. Dec. 1
(R – Nov. 24	THANKSGIVING DAY; NO CLASS)	
T – Nov. 29	232 CON.	Presentation: Guidelines on Term Proposal
R – Dec. 1	309 CON	Individual appointment to discuss Term Proposal (Report 3 due)
T – Dec. 6	232 CON	Oral presentation of Proposal for class discussion/critique
R – Dec. 8	NO CLASS	(Term Proposal preparation)
T – Dec. 13	309 CON	Term Proposal due at 0900; Make appointment for Exit Interview on Thursday, Dec. 15
R – Dec. 15	309 CON	Exit Interview by appointment

SYLLABUS

ZOO4204C

Prof. W. Herrnkind

Course Objectives:

(General and Topical)

1. To understand the biological features, limitations, and specializations of crustaceans, mollusks, and echinoderms in an array of Gulf of Mexico marine habitats.

(Inquiry Emphasis)

2. To gain competency in framing biological questions and conducting technically and methodologically sound investigations on behavior, ecology, biomechanics, and/or functional morphology of marine invertebrates, in the field and in the laboratory.
3. To gain competency in communicating complex biological ideas and information orally and in writing as a necessary step in developing as a practicing scientist.

Grading:

As 2. & 3. above imply, an essential goal of this class is to transform each of you from being a recipient of established knowledge to a discoverer of new knowledge. Therefore, the graded products will be your oral and written reports (see below). Note! Unlike common lecture-recall learning, you may expect to improve over the course *with experience and by responding to critique*.

Oral and Written Reports:

Research projects- Following each of the three projects, you will prepare an oral presentation (20 minute – 15min. presentation, 5 min. Q&A), describing the research you have just completed. The report will be made in conventional scientific format used at research seminars and scientific meetings. You will deliver this presentation to your classmates, Prof. Herrnkind, and Asst. Instructor Bouwma during the scheduled period (see *COURSE SCHEDULE*). Members of the class are *expected* to provide critique and suggestions on the presentation, allowing the presenter to incorporate this feedback into the subsequent written report. The written report is to follow standard scientific format (specifics to be provided) and will be due one week after the oral presentation is given. You will be graded (A, B, etc.) for the scientific and communicatory effectiveness of both the oral and written presentation. Based on a thorough written critique of the written report by Prof. Herrnkind, you are *encouraged* to revise accordingly and resubmit. Your grade will be based on the average of the two grades; i.e., the initial and revision grade.

Term Proposal- During the last part of the semester, you will prepare a ‘term’ research proposal (similar to a MS Thesis Proposal; specific directions to be provided) extending the investigation of a phenomenon of special interest to you generated over the previous portion of

the course. The proposal will be presented orally to the class prior to submitting the written report (no revisions) as above.

The three research project grades (oral and written together) each constitute 25% of the course grade and the term proposal (oral and written together) 25%. It is expected that you will meet individually with Prof. Herrnkind and Mr. Bouwma following each report for critique and suggestions leading to continual improvement in your ability to plan, perform and communicate a scientific study.

Lectures, readings, and class field trips:

A lecture reviewing the basic zoological character of each group precedes concentrated work on the crustaceans, mollusks and echinoderms. Equally important will be the introduction to the life-history and ecology of northern Gulf representatives of each taxon and the extensive class field trip to witness the organisms in their natural habitats. You will be expected to review invertebrate zoology prior to the lectures and to know fundamental aspects at the textbook level. There will also be reading and reference lists of key references and journal articles.

I. The higher marine invertebrates (Crustacea, Mollusca, and Echinodermata): synopsis and perspective.

- A. The nature of physical environments and organisms in marine and estuarine habitats.
- B. Field sampling of local habitats and species: distribution, abundance, diversity, community.

II. The Crustacea

- A. Review of basic morphology, phylogeny, and systematics (emphasis on decapods)
- B. Survey of major taxa: feeding, locomotion, reproduction, life cycles, larval features, appendage specialization, predator-prey relations, migration and movements, behavioral repertoire, distribution, and abundance.
- C. Key aspects of selected field/lab examples: *e.g.*, Fiddler crabs (*Uca pugilator*): semiterrestrial adaptations in morphology, physiology, senses, reproductive behavior, reproduction, larval stages, comparisons with fully marine decapods such as xanthid and portunid crabs (*Calinectes sapidus*, *Menippe mercemaria*); Hermit crabs: gastropod-shell resource acquisition and fitness role; communication and aggression, predation, commensal relations (field models – *Pagurus longicarpus*, *P. pollicaris*, and *Clibanarius vittatus*).

III. The Mollusca

- A. Review of basic biology (emphasis on Gastropoda).
- B. Survey of major taxa: feeding, locomotion, reproduction, life cycles, larval development, predator-prey relations, shell features and functional attributes, sensory modalities, population and community relationships, behavioral repertoire, distribution, and abundance.
- C. Key aspects of selected field/lab examples: *e.g.*, littorinid snails, littoral specializations in physiology and behavior, ecological role, predators, reproduction and development, adaptive radiation, habitats (field model – *Littorina irrorata*). Mud snails (Nassariidae): feeding, chemosensory-mediated behavior, predator-prey relations, reproduction, ecological role (field models – *Nassarius vibex* and *Melongena corona*). Various Neptunidae, Fasciolaridae, Naticidae: comparative locomotion; shell features, predator-prey relations with other molluscs, echinoderms, crustaceans, and fishes; hunting and antipredator specializations.

IV. The Echinodermata

- A. Review of basic biology.
- B. Survey of major taxa: feeding, locomotion, reproduction, functional morphology, life cycles, larval development, recruitment, predator-prey relations, symbioses, population and community relationships, distribution, and abundance (emphasis on Asterozoa, Ophiurozoa, and Echinozoa).

C. Key aspects of selected field/lab examples: comparison of sand and seagrass dwellers in feeding mode, locomotion, population dynamics, predator-prey interactions, morphology, and behavior (field models – *Luidia* spp., various brittlestars). Echinoids: comparative community relations, symbioses and commensals (field models – *Lytechinus variegatus*, *Mellita tenuis*)

Students with Disabilities

Florida State University provides high-quality services to students with disabilities, and we encourage you to take advantage of them. Students with disabilities needing academic accommodations should: 1) register with and provide documentation to the Student Disability Resource Center in Kellum Hall (644-9566), and 2) bring a letter to Dr. Herrnkind from the SDRC indicating that you need academic accommodations. Please do this as soon as possible, preferably within the first week of class.

FSU Academic Honor Code

It is assumed that all students will comply with the F.S.U. Academic Honor System (see Student Handbook pp. 81-82). The Academic Honor Code of F.S.U. is based on the premise that each student has the responsibility (1) to uphold the highest standards of academic integrity in the student's own work, (2) to refuse to tolerate violations of academic integrity in the University community and (3) to foster a high sense of integrity and social responsibility on the part of the University community. Any student whose words or acts demonstrate a disrespect for state or federal laws; Board of Regents rules or policies; or the rights, health, safety, or welfare of members of the community shall be subject to disciplinary action by the University. Students who violate academic standards through plagiarism and any other forms of cheating will be disciplined according to the procedures noted in the Undergraduate Bulletin.

FOR FSUML/FIELD DAYS

Bring with you all items needed to spend a full day in the field considering sun, rain, seawater, biting insects, food, and drink. Suggestions are:

1. Extra footwear for wading in marsh mud and on intertidal oysters (e.g., old/cheap lace-up sneakers)
2. Old clothes; shorts, T-shirts, lightweight long trousers, bathing suit.
3. Hat with a bill or brim to shade eyes and head from the sun. We urge you wear strong sun-block and polarized & ultra-violet reducing sunglasses
4. Poncho/rain gear

5. Towel, sunblock (we recommend SPF 30+), insect repellent (but be careful not to expose marine critters!).
6. Carry-bag for the above items.
7. Lunch and drinks (soda vending machines available at FSUML; bring change!)
8. Waterproof field notebook and pencils.
9. Heavy duty Zip-lock bags (for dry 'stuff' or wet 'critters').
10. Useful on some days (we'll give you advance notice): mask, snorkel, flippers, net bag, and dive skin (for snorkeling; we will not be SCUBA diving); wetsuit (especially after mid-October).

TIDE PREDICTIONS

We use a program titled WXTide32 to predict tides for the Marine lab and surrounding areas. The program is available at <http://www.wxtide32.com> -- we recommend that you download it for personal use. The program is available for Windows platforms only (including palmtop systems).