

## **Biology 596: Biology of Fishes Fall 2009 Syllabus**

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### **General Course Information**

Prerequisites: Biol 354 (Ecology and the Environment).

Lecture: T,Th 1230-1345, LS 343

Lab: Th 1400-1640, LS 343

#### Text Books:

Required: Allen, L.G., D.J. Pondella, and M.H. Horn (eds). The Ecology of Marine Fishes: California and Adjacent Waters. We will use much of this text but will also incorporate other materials.

Recommended: Miller, D.J. and R.N. Lea. Guide to the Coastal Marine Fishes of California. California Dept. Fish and Game Fish Bulletin 157. (This text can be ordered [Pub. ID # 4065] from A.N.R. Communications Services (1-800-994-8849; see website <http://anrcatalog.ucdavis.edu/InOrder/Shop/Shop.asp>). Cost: \$12.00

### **Furlough Days**

*Due to extraordinary budget cuts to the CSU, fees to students have increased 32%, many sections have been cut, and faculty will be required to take nine (9) unpaid furlough days each semester. These furlough days will unfortunately mean that I will be unable to include all elements of this class that I believe would provide the best educational experience. Unfortunately this is the result of a dramatic cut to the CSU by the state after years of under-funding the system. This class will not meet, and I will not be available for office hours, phone calls, or email consultation on the following regularly scheduled days: **September 17, October 13, November 24, and December 10**. In addition, assignments may be modified for this course.*

### **Course Goals & Student Learning Outcomes**

This class provides an introduction to the biology and ecology of fishes, including basic concepts in fisheries biology. Within this broad framework, you are expected to demonstrate knowledge of concepts and synthesize information.

Specifically, you should

- 1) demonstrate knowledge of ecological concepts and their relevance to coastal fishes**
- 2) link the basic biology of fishes to ecological processes**
- 3) identify the local fishes of southern California**
- 4) summarize concepts in fisheries biology and conservation**
- 5) interpret scientific literature**

- 6) **research a topic on the ecology of a family of fishes, write a paper on this topic, and recite an oral presentation**
- 7) **participate in group activities and labs**

### **Discussion papers**

The course involves some discussion activities of the primary literature. Students will be discussing published papers in ecology relevant to some lecture topics. Critiquing and discussing papers objectively is fundamental in evaluating scientific studies. Summaries of these papers will be required to foster discussion, and the greatest benefit will be achieved when the students thoroughly read the assigned papers.

### **Written assignments, papers and oral presentations**

You will work in groups and with lab partners on activities and labs pertinent to the biology and ecology of fishes. Written assignments, a research paper, and an oral presentation in Power Point are required.

### **Exercises and Field Trips**

All labs and field trips are required. Three field trips involve sampling fishes in the field, and the remaining two field trips are to the Scripps Institution of Oceanography for a tour of a world-renowned fish collection. All of these field trips are scheduled for Tuesday afternoons during the lab period, except for a Saturday field trip to sample intertidal fishes (because of a low tide). Attendance and participation count towards your grade.

### **Grading Policy and Exams**

**Grading:** The two midterm exams and final exam are worth almost half of your final grade. Eight unannounced quizzes will be given, and I will drop your lowest score for a quiz, a total of 70 possible points. You may earn up to 100 points from laboratory write-ups and assignments. Your performance in the lab section of the course will account for almost 45% of your grade. The final score and grade will be based on your total accumulated points (800 pts. maximum). Final grades will be based on percentages of points achieved from the standardized total points offered in the course based on the percentages of the categories below: A = 90-100%, B=80-89%, C=70-79%, D=60-69%, F=less than 60%. Plus/minus grading will be used.

I may adjust scores and percentages based on the class average and my judgment regarding class performance. **However, I will only do so if the class average is particularly low. Do not assume that I will alter grades.** To ensure that you receive a particular grade, the above percentile ranges apply. Please remember that long-standing University policy considers a grade of A to represent exemplary performance, indicative of "outstanding achievement; available only for the highest accomplishment," while a grade of B indicates a "praiseworthy performance; definitely above average." I hope you will all strive to demonstrate exemplary performance.

<b>Grading schedule (approximate):</b>		
Midterm Exams (2 @ 100 pts.)	200	25%
Final Exam (150 pts.)	150	18.8%
On-line Quizzes	100	12.5%
Laboratory write-ups; assignments	100	12.5%
Written Research Paper	100	12.5%
Oral Presentation	50	6.3%
Lab Practical	50	6.3%
Participation in Lab /Attendance	50	6.3%
<b>TOTAL</b>	<b>800</b>	<b>100%</b>

**Exams: Midterm** exams will cover material presented since the previous exam, recognizing that your knowledge will build over the semester (100 pts each). The final exam will cover material since the last midterm exam (100 pts) and major concepts and ideas presented over the semester (50 pts.). Exams will consist of multiple choice, short answer, and essay questions. There will be no make-up exams unless there is written verifiable documentation of an unavoidable emergency. Missing an exam because your employer wants you to work is not an adequate justification. Make-up exams will consist of essay questions only. There is no make-up for a final exam, and please do not ask to take the final exam or any exam at an earlier time or date. **To receive a make-up exam, you must contact me no more than 24 hours after the exam is administered and be able to provide a valid excuse. It is your responsibility that the professor has received your communication of your absence.**

#### **On-line Quizzes:**

On-line quizzes typically will include 5 multiple choice or true/false questions. The reason for these quizzes is to help you review a previous lecture or to read a chapter that is relevant for the next lecture. No make-ups will be given for on-line quizzes, but the lowest quiz score will be dropped (including a score of zero for a missed quiz). Thus, it will be to your advantage to do well on all of them to try to earn the maximum number of points. Because these quizzes will involve what is going on with course material, it will be important for you to be in class each day.

#### **Other Information**

Cheating has rarely been a problem in this course, and warning you about the consequences may seem unnecessary. Nevertheless, to avoid any possibility of you not recognizing such consequences, this is my policy: If you are caught cheating during an exam or on an assignment, you will receive a zero on the exam or assignment. In addition, as required by SDSU policy, the event will be reported to campus judicial authorities and may lead to additional actions from the University. **Incidents of plagiarism are particularly serious, and the instructor of this course has the right to expel you from the course or determine any suitable punishment for cheating as he sees fit.** Remember, your responses in exams and in written assignments must be in your own words. I strongly recommend that you review the site below to obtain a clear explanation of plagiarism, cheating, and similar inappropriate conduct. If you are unsure of what constitutes plagiarism, see the instructor.

**<http://science.widener.edu/svb/essay/plagiar.html>**

The last day to drop a class is **September 14.**

**TENTATIVE SCHEDULE (subject to change)**

<b>Date</b>	<b>Topic</b>	<b>Readings (Chapters)</b>
<b>Week 1</b>		
Tue: Sep. 1	Lec: Introduction to course; diversity of fishes <i>Lab:</i> Diversity of California fishes (fresh-frozen specimens); keying exercise	
Thu: Sep. 3	Lec: Biogeography, classification	<b>1</b>
<b>Week 2</b>		
Tue: Sep. 8	Lec: Anatomy, structural features of fishes <i>Lab:</i> Representative families of fishes (frozen and preserved specimens; external and internal anatomy	(see ichthyology text)
Thu: Sep. 10	Lec: Adaptations, ecological classification (habitats)	<b>3, 4</b>
<b>Week 3</b>		
Tue: Sep. 15	Lec: Functional design – body shape, swimming, feeding, sensory abilities <i>Lab:</i> Matching fishes to habitats	(see ichthyology text)
<b>Thu: Sep. 17</b>	<b>Lec: <u>FURLOUGH DAY -- NO CLASS</u></b>	
<b>Week 4</b>		
Tue: Sep. 22	Lec: <b><u>Lab Practical</u></b> <i>Lab:</i> <b><u>Lab Practical (cont'd)</u></b> , example discussion paper, library research	
Thu: Sep. 24	Lec: Reproduction and life histories	<b>19</b>
<b>Week 5</b>		
Tue: Sep. 29	Lec: Feeding ecology <i>Lab:</i> *** required field trip – SIO fish collection @ 1430 ***	<b>14</b>
Thu: Oct. 1	Lec: <b><u>Midterm I</u></b>	
<b>Week 6</b>		
Tue: Oct. 6	Lec: Biotic interactions: Competition <i>Lab:</i> Discussion papers (competition/predation)	<b>17</b>
Thu: Oct. 8	Lec: Biotic interactions: Predation	<b>16</b>
<b>Week 7</b>		
<b>Tue: Oct. 13</b>	<b>Lec: <u>FURLOUGH DAY -- NO CLASS</u></b> <b><i>Lab:</i> <u>FURLOUGH DAY -- NO CLASS</u></b>	
Thu: Oct. 15	Lec: Larval ecology and recruitment	<b>11 (pg. 306-313), 15</b>
<b>Week 8</b>		
Tue: Oct. 20	Lec: Fish communities; rocky reef and kelp bed fishes <i>Lab:</i> *** required field trip – beach seine exercise *** (-0.3 tide at 5:34 pm)	<b>9</b>
Thu: Oct. 22	Lec: Pelagic fishes	<b>12</b>

<b>Date</b>	<b>Topic</b>	<b>Readings (Chapters)</b>
<b>Week 9</b>		
Tue: Oct. 27	Lec: Soft-bottom and deep-sea fishes <i>Lab</i> : Discussion papers (larval ecology / recruitment)	5, 7
Thu: Oct. 29	Lec: Freshwater fishes	
<b>Week 10</b>		
Tues: Nov. 3	Lec: Intertidal fishes	8
<b>Sat: Nov. 7</b>	<b>Lab: *** Saturday required field trip – intertidal fishes exercise *** (Noon to ~ 3:30 p.m.; -0.2 tide at 1:01 pm)</b>	
Thurs: Nov. 5	Lec: <u>Mid-term II</u>	
<b>Week 11</b>		
Tues: Nov. 10	Lec: Estimating fish population size <i>Lab</i> : Mark-recapture exercise	9 (pg. 228-232)
Thurs: Nov. 12	Lec: History and implementation of the Marine Life Protection Act	
<b>Week 12</b>		
Tues: Nov. 17	Lec: Introduction to fisheries: history, concepts, effects on populations and communities <i>Lab</i> : Discussion papers (effects of fishing)	22
Thurs: Nov. 19	Lec: Life history, distribution, and stock structure	
<b>Week 13</b>		
<b>Tues: Nov. 24</b>	<b>Lec: <u>FURLOUGH DAY -- NO CLASS (Independently work on written reports)</u></b> <b>Lab: <u>FURLOUGH DAY -- NO CLASS (Independently work on written reports)</u></b>	
Thurs: Nov. 26	Lec: <b>Thanksgiving recess</b>	
<b>Week 14</b>		
Tues: Dec. 1	Lec: Fisheries conservation and management <i>Lab</i> : Discussion papers (fisheries conservation/management)	
Thurs: Dec. 3	Lec: Pollution, Alien Species, Climate Change	23, 24, 25
<b>Week 15</b>		
Tues: Dec. 8	Lec: Oral presentations of written reports <i>Lab</i> : Oral presentations of written reports	
<b>Thurs: Dec. 10</b>	<b>Lec: <u>FURLOUGH DAY -- NO CLASS</u></b>	
<b>Week 16</b>		
<b>Final exam (Thursday, Dec. 17, 1300-1500); Room: LS 343</b>		