OBJECTIVES: Mariculture techniques are presented from a historical perspective to the "state of the art" at state government and commercial facilities. Methods used to culture aquatic animals to include current hatchery production practices for fish species such as red drum, spotted seatrout, and southern flounder will be discussed. Key issues associated with aquaculture sustainability, successful culture for food production, and species conservation (stock enhancement) will be the focus of the lectures. These issues include spawning and rearing practices, animal health, water quality, aquatic and near-shore ecosystem conservation, relationship with fisheries, and government regulations. The production practices are further experienced through laboratory exercises and field trips. Students who successfully complete the course are expected to acquire basic understanding and knowledge of specific requirements of different aquaculture production operations along with the key factors affecting the performance of these systems. In addition, students will be able to master different techniques associated with the production of aquatic organisms in captivity.

Class Times: Lectures are Thursday from 1:00-2:40 p.m. The Lab session will be held Friday from 3:00-4:55 p.m.

Laboratory: There will be no direct grading of students with respect to lab. The lab exercises are meant as time for students to practice different techniques and skills associated with day-to-day operation of aquaculture facilities.

Term Paper: You will be required to select a topic (from the term paper Topic List*) and describe methods used to culture your selected species for food production (i.e., farm reared salmon) or for conservation (i.e., red drum for stock enhancement). Thus, the term paper will be structured with the following: Title, Author(s), Introduction, Comprehensive Knowledge of Topic, Conclusions & Recommendations, and References. Report requires at least ten cited references. *Students may select other related topics as approved by instructor.

Seminar Presentation: Each student will select one aquaculture species as a
seminar topic (from Species List) to be researched (how to culture for purposes of mariculture) during the semester. On December 05, 2008, a week before the final exam, students will deliver a 15-min oral presentation summarizing their work. Use of slides, overheads, live or preserved animal samples when applicable, is highly recommended.

Field Trips*: You will be going on two (2) field trips during the lab period, and you are required to attend both of them. Possible weekend trips will be optional. There will be questions on the exams related to the field trips scheduled during lab time.

Textbook: No text is required. However, articles from the scientific literature or books chapters will be placed on reserve or handed out in class as outlined below. Additional readings may be added periodically to complement the lecture series.

Grading Policy**: Evaluation system - There will be two mid-term exams (worth 20% each), a term paper (worth 20%), an oral presentation (worth 20%), and a final (worth 20%). A term paper turned in late will be penalized (5%) for each day it is late unless prior arrangements have been made. Approximately 65-70% of the material on the exams will be from information presented in lecture, and approximately 30-35% will be from the assigned reading or and/or laboratory exercises.

The three exams will consist of short answer (problems, definitions, compare-and-contrast, matching etc.) and discussion questions. The exams will each cover four lectures.

Schedule of Topics – Fall 2008: The schedule below is a preliminary outline of the semester. Changes in specific dates may occur. It is your responsibility to keep up with changes to this outline.

(Week 1)
Aug. 28 Introduction: Syllabus, species list, and scheduled field trips. Location: TAMU-CC, CI 102.
Aug. 29 Lab: No lab scheduled.

(Week 2)
Sep. 05 Lab: Fish broodstock collection, transport and induced spawning. Location: CCA/CPL Marine Development Center (MDC) Conference Room - Flour Bluff.
(Week 3)
            ©SUBMIT an outline of your term paper.
Sep. 12  Lab: Anesthetics, tagging, hormones, lights, timers, photo and
            thermoperiod. Location: MDC, Conference Room - Flour
            Bluff.

(Week 4)
Sep. 18  Lecture: Rearing Environment II. Location: TAMU-CC, CI
            102.
Sep. 19  Lab: Fish egg and larval rearing techniques. Food-chain organism
            cultures (Copepoda, rotifers, Artemia). Location: MDC
            Conference Room - Flour Bluff.

(Week 5)
Sep. 25  Lecture: Term Exam #1. Location: TAMU-CC, CI 102.
Sep. 26  Lab: Electronic resources availability and use. TAMU-CC
            Library, Room 109.

(Week 6)
          ©SUBMIT an outline of your selected seminar presentation.
Oct. 03  Lab: Field Trip to University of Texas Marine Science Institute
          at Port Aransas. We will be leaving TAMU-CC on October 03rd at
          1:00 p.m.

(Week 7)
Oct. 09  Lecture: Aquaculture culture units. Location: TAMU-CC, CI
            102.
Oct. 10  Lab: Phytoplankton, zooplankton and larval counts, population-
            estimates. Location: MDC Conference Room - Flour Bluff.

(Week 8)
Oct. 17  Lab: UV, ozone, bag filters, cartridge filters, DE filters, sand
            filters, bead filters, foam fractionators. Location: MDC
            Conference Room - Flour Bluff.

(Week 9)
Oct. 24  Lab: Field Trip to commercial Redfish farm, Perry R. Bass
            Marine Fisheries Research Station, and Rockport Marine Lab. We
            will be leaving TAMU-CC on October 24th at 9:00 a.m.

(Week 10)
Oct. 31  Lab: No Lab.
(Week 11)  
Nov. 06  Lecture: Southern Flounder Culture I. Location: TAMU-CC, CI 102.
Nov. 07  Lab: Use of multi-task water quality monitoring equipments, monitoring turbidity, total suspended solids (TSS), volatile suspended solids (VSS), settleable solids (SS); review Best Management Practices for Aquaculture. Location: MDC Conference Room - Flour Bluff.

(Week 12)  
Nov. 13  Lecture: Southern Flounder Culture II. Location: TAMU-CC, CI 102.
Nov. 14  Lab: Rearing pond fertilization strategies. Location: MDC Conference Room - Flour Bluff.

(Week 13)  
Nov. 20  Lecture: Spotted Seatrout Culture. Location: TAMU-CC, CI 102.
Nov. 21  Lab: Rearing pond harvests, and transport of fishes, and coded wire tagging. Location: MDC Conference Room - Flour Bluff.

(Week 14)  
Nov. 27  Lecture: Thanksgiving Holiday - No Class.
Nov. 28  Lab: No Lab.

(Week 15)  
Dec. 04  Lecture: Sustainable Marine Fish Culture.
Dec. 05  Lab: Term papers due; Seminar presentations. Location: MDC Conference Room - Flour Bluff.

(Week 16)  
Dec. 11  Lecture: Final Exam. Location: TAMU-CC, CI 102

Important Dates for the Fall Semester of 2008

- The two term Exams are on Thursdays: September 25th and October 30th.
- The last day to drop with a "W" (you must submit Withdrawal Authorization Form) is December 08th.
- The Final Term Exam is on Thursday, December 11th, 1:45 – 4:15 p.m.

Other Dates to Remember:

Written papers are due at the beginning of class on Friday, December 05th. Seminar presentations will be presented Friday, December 05th.

*Field Trips: Two field trips (day) are scheduled for the class. The first trip is scheduled for October 03rd. We will leave the school on Friday, October 03rd at 1:00 p.m. and return late afternoon on that day. Transportation will be provided by TAMU-CC. The second trip is scheduled for October 24th. We will leave school at 9:00 a.m.
on Friday, October 24th and return late afternoon on that day. Transportation will be provided by TAMU-CC but you need to pay for your meals.

The following is a tentative list of field trips planned for this course.
1. The Texas Agricultural Experiment Station, Marine Shrimp Research Lab., Port Aransas.
2. The University of Texas Marine Science Institute, Port Aransas.
3. CCA/CPL Marine Development Center, Flour Bluff, Corpus Christi.
5. Rockport Marine Laboratory.
6. Fish and shrimp farms near Palacios.

Grading**: Your final grade is based on the accumulation of points according to the following weights (%):

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent of Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test I</td>
<td>20</td>
</tr>
<tr>
<td>Test II</td>
<td>20</td>
</tr>
<tr>
<td>Term paper</td>
<td>20</td>
</tr>
<tr>
<td>Fifteen minutes oral-presentation of a selected species topic</td>
<td>20</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

To enhance the student experience in aquaculture related research activities and to earn five Bonus points, each student has the opportunity to complete 40 hours of internship during the semester in one of the research facilities in the area (TPWD, TAES, TAES-SMRL-PA; UTMIA-PA). You will need to provide a letter from the person in charge of the research facility to show that the internship was completed in order for you to receive the five (5) credit-points.

Grading for the course will be as follows: A = 100-90 points, B = 89-80 points, C = 79-70 points, D = 69-60 points, F < 60 points.

Class Participation: Failure to attend more than two class lectures/lab without the instructor's prior consent will constitute a loss of 10 points from the student's final grade. It is the student's responsibility to check their own personal schedules to insure class attendance.

Lab Sections & Instructors: There is only one laboratory section for this course. Laboratory instructor for this course is Dr. Robert Vega (CCA/CPL Marine Development Center- Flour Bluff, robert.vega@tpwd.state.tx.us; 939-7784).
Lab Materials: Lab procedures call for active participation of the students in procedures associated with operating aquaculture facilities.

General Information: The Mariculture Program complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. If you need disability accommodations in this class, please see me as soon as possible. Please have your accommodation letter from TAMUCC Services for Students with Disabilities Office with you when you come see me. If you suspect that you may have a disability (physical impairment, learning disability, psychiatric disability, etc.), please contact the Services for Students with Disabilities Office (located in Driftwood 101) at 825-5816. It is important that you contact them in a timely fashion as it may take several days to review requests and prepare accommodations. Students with special needs to observe recognized religious (holy) days should arrange ahead for their needs.

All students are expected to conform to college-level standards of ethics, academic integrity, grammar and spelling. In particular, by enrolling in MART-5312 for academic credit, you agree to be bound by the Regulations and Procedures published in the TAMU-CC Student Handbook. All students should be familiar with the Aggie Honor Code (Honor Council Rules and Procedures) on the web at: http://www.tamu.edu/aggiehonor). Group interactions, investigations, and studying are encouraged; however, duplicate work, in which more than one student claims credit for essentially the same material, will be treated as cheating and will receive a grade of zero. Except in cases of an emergency (as certified by documentation) or where prior arrangements have been made with the instructor, there is no provision for making up late work and/or missed take-home tests (e.g., you will lose the credit points assigned to this work). Entry to the classroom will be closed on the day of final exam soon as the first student to complete an exam has left the room. Students absent or arriving after room closure will receive a zero for the exam.