AQUATIC ANIMAL NUTRITION (FAMA 5314)
Department of Life Sciences
FALL 2017

A. COURSE INFORMATION

Course number/section: FAMA 5314.001
Class meeting time: Friday, 2:00-4:30 PM
Class location: OCNR-255
Course Website: none

B. INSTRUCTOR INFORMATION

Instructor: Joe M. Fox, Ph.D.
Office location: NRC 3413
Office hours: M/TH 8:00-9:00 AM and T/W/F 8-10 AM and by appointment
Telephone: (361) 825-2463 (office)
e-mail: joe.fox@tamucc.edu
Appointments: Make at least 24 hrs in advance by e-mail.

C. COURSE DESCRIPTION

Catalog Course Description 3 sem. hrs. (3:0): The study of current concepts in aquatic animal nutrition including nutrient sources and requirements, deficiency effects, ingestive/digestive/metabolic processes, formulation and processing of feeds, and practical feeding considerations for selected aquatic species.

Extended Course Description
Aquaculture is the controlled cultivation of aquatic organisms. It currently supplies about 50% of all consumed seafood. Traditional capture fisheries landings worldwide have been flat for the past 25 years at approximately 90 million metric tonnes. With an increasing world population and increasing global demand for seafood, aquaculture is the only method to meet demand. Aquaculture output is needed to increase 100% by the year 2030 to meet the global demand; it has been increasing at an annual rate of 6.2%.

Aquatic animal nutrition regards how animals in diverse environments, including aquaculture, obtain and process nutrients for growth and maintenance. We will discuss and review the basic principles of nutrition as it relates to all animals, describe major nutrient classes, identify and characterize ingredients or compounds that play major and minor roles in aquatic nutrition, explore different means whereby feeds for aquatic animals are manufactured and discuss different strategies for maximizing growth of aquatic organisms in diverse environments.
D. PREREQUISITES AND COREQUISITES

Prerequisites
None

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
None, but reading will be required from website material, journals, newspapers, magazines, and library holdings.

Optional Textbook(s) or Other References


Supplies
None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more
efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

**By the end of this course**, students should be able to:

1. Define the role of nutrition in culture of aquatic organisms.
2. Describe the processes of ingestion, digestion and excretion.
3. Describe the concepts of energy partitioning, enzyme digestibility, and protein:energy ratio as they pertain to aquatic animal nutrition.
4. Discuss and differentiate the various nutrient classes.
5. Describe the basic categories of aquatic feed ingredients and the feed manufacturing process including feed formulation and storage.
6. Describe various strategies for management of feed usage in culture of aquatic organisms. in detail commercial culture systems and compare their advantages and disadvantages.
7. Assimilate information from peer-reviewed scientific journal articles and discuss its relevance to development of the science of aquatic animal nutrition.
8. Assimilate information from peer-reviewed journal articles and critique articles in terms of objectives, rationale, experimental design, statistical analysis, and results (i.e., a basic understanding of the components and concepts underlying peer-reviewed scientific literature).

**G. INSTRUCTIONAL METHODS AND ACTIVITIES**

The course will be taught through traditional lectures with relevant topical discussions, journal article critiques, and an individual term paper as agreed upon by the student and professor.

**H. MAJOR COURSE REQUIREMENTS AND GRADING**

The learning outcomes stated earlier will be assessed through a variety of methods as noted in the following table.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture exam 1*</td>
<td>20</td>
</tr>
<tr>
<td>Lecture exam 2</td>
<td>20</td>
</tr>
<tr>
<td>Lecture eExam 3</td>
<td>20</td>
</tr>
<tr>
<td>Term paper (approved, standard format)</td>
<td>24</td>
</tr>
<tr>
<td>Journal article critiques</td>
<td>16</td>
</tr>
<tr>
<td>Total points</td>
<td>100</td>
</tr>
</tbody>
</table>

*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.
Grading: There will be a total of three (3) written exams worth 20 pts each. Exams may be composed of any, or all, of the following: multiple choice, definitions, matching, fill in the blank, problem solving and short essay. The final exam is not a comprehensive exam; however, all information obtained by the student prior to that point can be used to answer questions. All exams count toward your class grade. No exam grade will be dropped. No make-up exams will be given. If an exam is missed with proper prior notification, the test may be taken as soon as possible after the exam date, but no later than the following class day. If the exam is not taken a grade of zero (0) will be entered. No extra credit assignments will be given. The four journal article critiques are worth 4 pts each and are due on arrival in the class on their respective due dates. They will be evaluated by the instructor and returned the following class period during which they will be discussed. There will be a term project (24 pts) due near the end of the semester. These will be graded and returned to students prior to the final exam.

The grading scale is: A=89-100%, B=79-88%, C=69-78%, D=59-68%, and F=0-58%. All grades will be rounded to the nearest whole number, therefore, a grade of 88.50% would be rounded to 89% (A) and a grade of 88.49% would be an 88% (B). Last day to withdraw from class with a "W" is Friday, 6 November, and must be done by the student.

I. COURSE CONTENT/SCHEDULE

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

<table>
<thead>
<tr>
<th>Date</th>
<th>Course Topics</th>
<th>Readings:</th>
<th>Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/1</td>
<td>Syllabus, Intro, Body Composition</td>
<td>Syllabus, personal notes</td>
<td></td>
</tr>
<tr>
<td>9/8</td>
<td>Chemoattraction</td>
<td>Sanchez et al. (2004); Lee and Meyers (1999)</td>
<td></td>
</tr>
<tr>
<td>9/15</td>
<td>Digestion and Metabolism</td>
<td>Maynard and Loosli (1969), Ceccaldi (1999); Bureau and Hua (2006)</td>
<td></td>
</tr>
<tr>
<td>9/29</td>
<td>Protein:Energy, Critique #1 due, proposal and brief discussion of Term Paper topics</td>
<td>Fox (2004)</td>
<td>4</td>
</tr>
<tr>
<td>10/6</td>
<td>Exam 1 (covers from 8/27-9/24, inclusive)</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>10/13</td>
<td>Proteins and amino acids, Critique #2 handed out</td>
<td>Lovell (1989); Guillaume (1999)</td>
<td></td>
</tr>
<tr>
<td>10/20</td>
<td>Lipids, phospholipids, Critique #2 due</td>
<td>Lovell (1989); D’ Abramo (1999); Teshima (1999);</td>
<td>4</td>
</tr>
<tr>
<td>10/27</td>
<td>Carotenoids and carbohydrates</td>
<td>Loovel (1989); Meyers and Latscha (1992)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Critique #3 handed out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/3</td>
<td>Vitamins and minerals</td>
<td>Shiau (1999); Conklin</td>
<td></td>
</tr>
</tbody>
</table>
J. COURSE POLICIES

Attendance/Tardiness
Each student’s individual career experiences provide valuable perspective to their peers. Therefore, it is critical that you attend class regularly to be a partner in this learning environment. At each class meeting, attendance will be noted. It is each student’s responsibility to contact the instructor directly (phone or e-mail), in advance, if class will be missed. The instructor will not accept late work without valid reasons. Students with a university approved scheduled absence (athletics, military duty, etc.) must contact the instructor well in advance (>72 hrs) of a scheduled absence. Exams may be taken early in those specific cases. Students who do not arrange to take exams ahead of time will not be eligible for this special consideration. A written excuse from the university department involved is required.

Students are encouraged to contact the instructor anytime they are not achieving their intended level of success, prior to taking any other action. Students who need to withdraw must complete an official form and submit it consistent with college policy no later than the official published date. “Incomplete” grades are awarded only when an emergency prevents a student from completing a minor portion of the course assignments. Active participation is a part of your grade. It includes (1) asking questions; (2) answering questions with supportive evidence; (3) responding to other student’s comments, etc. Students are expected to be on time for class, to address others with respect, and to project an attentive and concerned demeanor.

Late Work and Make-up Exams
All exams count toward your class grade. No exam grade will be dropped. No make-up exams will be given. If an exam is missed with proper prior notification, the test may be taken as soon as possible after the exam date, but no later than the following class day. If the exam is not taken a grade of zero (0) will be entered.

Extra Credit
No extra credit assignments will be given.

**Cell Phone Use**
The use of cell phones and other personal electronic devices (PEDs) are prohibited during class. All cell phones must be turned off during the class period. If you are emergency personnel (i.e., EMT, fire, or police) you may set your device to vibrate. Any student who uses a cell phone to make or answer a call, send and read text messages or e-mails (other than TAMUCC emergency messages), or any other use of a personal electronic device during class may have that device confiscated and be asked to leave class, which will be considered an absence for that class. No student has the right to disturb the teaching and learning process. Voice recording of lectures is allowed, but no video or photography are allowed during class.

**Laptop Use**
Laptop computers and tablets may be used in the classroom for taking notes, as long as they are not a nuisance to other students. However, laptops shall not be used for items as noted above for cell phones or PEDs.

**Food in Class**
There is NO eating or drinking in the classroom.

**Missed Exam**
If an exam is missed with proper prior notification, the test may be taken as soon as possible after the exam date, but no later than the following class day. If the exam is not taken a grade of zero (0) will be entered.

**Participation**
Four or more absences, with the exception of death in the nuclear family, sick child/spouse, or personal sickness may result in a failing grade at the discretion of the instructor. You must contact the instructor by phone message or e-mail before class to let the instructor know of your absence.

**Others**
Cheating is defined as:
- Copying to any extent the work of another student
- Intentionally assisting another student during an examination
- Having access to material related to an examination during an examination
- Possessing or having access to unauthorized copies of an examination
- Departing from any stated examination conditions
Cheating or other academic dishonesty for exams and assignments will not be tolerated and will result in a Failing (F) grade for the class and suspension.

Plagiarism: The Merriam-Webster Dictionary defines plagiarism as "To pass off as one’s own words or ideas of another."
Plagiarism involves:
• Submitting another person's work as one's own
• Submitting work from any source that is not properly acknowledged by footnote, bibliography, or reference within a paper
• Submitting work pieced together from phrases and/or sentences from various sources without acknowledgement
• Submitting work with another person's phrase(s) rearranged without acknowledgement
• Submitting work that uses any phrase, sentence, or stylistic mannerism without acknowledgement
• Omitting quotation marks from any directly quoted material
• Failure to use three dots (...) to indicate omission of one or more words
• Any other actions deemed to be plagiarism

J. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is intentionally, knowingly, or carelessly presenting the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade. See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

• Classroom/Professional Behavior
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

• Statement of Civility
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.
Deadline for Dropping a Course with a Grade of W (University)

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

Grade Appeals (College of Science and Engineering)

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/
• Statement of Academic Continuity
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

K. OTHER INFORMATION

• Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

• Methods of Achieving Success
  Achieving success in this course will require a time commitment outside of class that averages three to six hours per week for reading and studying. Students benefit from actively participating in classroom discussion and feasibility analysis.

GENERAL DISCLAIMER

The instructor reserves the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. Changes will be announced in a timely manner during regularly scheduled lecture periods.