

WFSC 444 Aquaculture I – Principles and Practices

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Course description:

This course covers major principles of aquatic animal production under controlled conditions. Scientific perspectives on aquaculture production techniques associated with prominent species produced for food and stock enhancement throughout the world are presented. Special emphasis is given to species cultured in the United States.

Prerequisites: junior or senior classification or approval of instructor.

Course objectives:

Provide scientific perspectives concerning the major principles associated with aquatic animal production under controlled conditions.

Provide an overview of the production techniques associated with prominent species produced via aquaculture throughout the world with emphasis on those cultured in the United States.

Learning outcomes:

Students will be able to understand major concepts and principles of aquacultural production.

Students will be able to gain an appreciation for various types of aquacultural production systems and value their different applications.

Students will be able to integrate and apply principles of aquaculture to species that are either established or emerging as candidates for production under controlled conditions. In doing so, students will be able to demonstrate competence in understanding and adapting various production techniques in aquaculture.

1. Introduction – week 1
 - a. History of aquaculture
 - b. Current status and future perspectives
2. Water sources – weeks 2 and 3
 - a. Ground water
 - b. Surface water
 - c. Municipal water
3. Water systems – weeks 4 and 5
 - a. Earthen ponds
 - b. Flowing-water systems including raceways and partitioned aquaculture systems
 - c. Cages and net pens
 - d. Recirculating systems
4. Site selection and facility construction – week 6
 - a. Siting requirements
 - b. Preferable characteristics

5. Water quality – weeks 7 and 8
 - a. conservative aspects of water quality including alkalinity, hardness, temperature, salinity, turbidity
 - b. non-conservative aspects of water quality including dissolved oxygen, pH, ammonia, nitrite, nitrate
 - c. Influence of primary productivity on water quality
6. Nutrition and feeding – week 9
 - a. Biochemistry of major nutrient groups including protein, lipid, carbohydrate, minerals and vitamins
 - b. Principles of diet formulation and feed ingredients
 - c. Feed processing methods
 - d. Feeding practices, strategies and standards
7. Reproduction, genetics, and breeding – week 10
 - a. Reproductive physiology
 - b. Genetic principals applied in aquaculture
 - c. Induced spawning
 - d. Breeding programs
8. Diseases and parasites – week 11
 - a. Major disease-causing organisms including bacteria, fungi, protozoans and viruses
 - b. Methods of disease treatment
 - c. Chemotherapeutic agents
9. Handling, harvesting and processing – week 12
 - a. Seining, grading and other handling procedures
 - b. Hauling practices and considerations
 - c. Product forms and processing procedures
10. Production Techniques – weeks 13 and 14

Techniques cover the following species: Catfishes, crayfishes, penaeid shrimp, baitfishes, sportfishes, carps, tilapia, red drum, salmonids, molluscan shellfish

Two Exams: Mid-term and final exams.

Laboratory: Approximately seven laboratory sessions will be held to apply and/or demonstrate principles discussed in lecture. Additional sessions will be held to learn and practice important techniques used in aquaculture.

Grading: The final grade will be computed as follows: 35% for each exam, 25% for laboratory reports and 5% for class attendance and participation.

Grading scale: A = 100 – 90
 B = 89 – 80
 C = 79 – 70
 D = 69 – 60
 F = < 59

Field trips: Optional, to be arranged.

Text: Stickney, R.R. (2017) Aquaculture: An Introductory Text, 3rd edition, ISBN – 978 1 78639 009 7, CABI Publishing.

Americans with Disabilities Act (ADA) Policy Statement

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 contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

Academic Integrity Statement

Aggie Honor Code

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Please refer to the Honor Council Rules and Procedures on the website <http://aggiehonor.tamu.edu>

For all assignments and exams you will be required to sign the following:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of student

Attendance and Make-up policy

Regular attendance and class participation is strongly encouraged and will constitute 5% of the final grade. Make-up exams will be given only with a university-authorized excuse. Please refer to student rule 7 at <http://student-rules.tamu.edu/rule07>.

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Laboratory

Time and site: Wednesday 3:00-6:00. Laboratory exercises will take place at the Aquacultural Research and Teaching Facility off Highway 60 West (approximately 10 miles from campus).

Teaching Assistant: Alton Burns; altonburns@tamu.edu; 979-847-9330

Schedule: Each subject will be covered during one weekly laboratory period.

Grading: A written report must be submitted for each laboratory subject one week after each laboratory session. Specific instructions on areas to be addressed in the report will be provided with each assignment. Grading will be based on how well those areas are addressed.

If a laboratory session is missed, a make-up assignment will be made for that session.

The laboratory grade will constitute 25% of the final course grade.

Lab. no.	Subject
1.	Design, construction and evaluation of pond, raceway and cage culture systems
2.	Water sources, supplies and water quality measurement
3.	Formulation, manufacture and analysis of diets; evaluation of feeding practices
4.	Diagnosis and treatment of diseases and parasites
5.	Induction of spawning in fish
6.	Harvesting of culture systems
7.	Transporting, grading and processing of aquaculture products