MRSC A245: PRACTICAL EXPERIENCE IN AQUACULTURE I

Item	Value
Curriculum Committee Approval Date	03/12/2025
Top Code	040100 - Biology, General
Units	2 Total Units
Hours	108 Total Hours (Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

This course introduces students to the complexity involved in working in and actively managing a functioning aquaculture facility as a student apprentice. Students will gain hands-on experience operating, maintaining, and managing recirculating aquaculture systems. Work experience will include students taking an active role in identifying potential issues, evaluating possible solutions, and implementing resolutions based off of best practices for rearing a variety of aquatic organisms. All prospective students will be required to perform a facility safety and proficiency demonstration to enroll in this course. PREREQUISITE: MRSC A120. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Evaluate the design, construction and effectiveness of recirculating aquaculture system filtration, water flow and species composition.
2. Demonstrate proficiency in testing water parameters and resolving any potential issues before they become a problem.
3. Identify common aquacultured species and how to use best practices to maximize growth rate and reproductive potential.

Course Objectives

- 1. Describe proper design, construction and effectiveness of recirculating aquaculture systems including filtration, plumbing, and water flow.
- 2. Illustrate the proper techniques to test water parameters and resolve potential issues before they become a problem.
- 3. Describe the challenges of keeping common aquatic aquacultured organisms and how to recognize and address potential health problems.
- 4. Explain proper maintenance of recirculating aquaculture systems.

Lecture Content

Lecture: not applicable.

Lab Content

1. Recirculating aquaculture system design and construction (filtration, species planning, ease of maintenance) 2. Advanced system characteristics 3. Proper maintenance and critical analysis of potential problems 4. Recirculating aquaculture system plumbing 5. Water chemistry and methods of achieving proper water quality 6. Species composition planning 7. Husbandry techniques for fish, invertebrates and plants 8. Facility management and developing procedures to keep recirculating aquaculture systems clean, safe, and efficient 9. Use of technology in the recirculating aquacutlure systems including advanced lighting, reactors and controllers 10. Effective group management 11. Potential careers involving aquaculture skills and experience 12. Leadership, initiative, and working as an effective team in an aquaculture farm setting 13. Developing educational content, good communication skills and effective teaching techniques 14. Contributing to social media content and aquaculture facility tours as part of the aquaculture program's community outreach 15. Quarantine and health procedures that can identify and treat sick and injured organisms 16. Emergency procedures related to system failures and safety guidelines 17. Diversity of aquaculture systems, equipment, organisms, and procedures exhibited at OCC

Method(s) of Instruction

- Lab (04)

Instructional Techniques

This class will employ a variety of instructional techniques. Weekly class meetings will incorporate class discussions led by the instructor but heavily dependent on student contributions. Student presentations on special topics will commonly accompany these discussions. Guest speakers and field trips will help provide additional specialized information. The development and completion of both group and individualprojects will be a central focus. Students will also be evaluated and coached in their modeling and explanation of content to general aquaculture science students during their lab hours.

Reading Assignments

Reading assignments will be based on researching alternate methods of achieving recirculating aquaculture systems (RAS) water quality goals and husbandry information on existing and potentially new species for the RAS. Based on the number of species kept in the facility, this will be a significant component.

Writing Assignments

Writing will play a major role in the course through the primary aquaculture journal communicating and documenting system parameters as well as itemizing the work that is completed each day. Education and advertising materials may also be assigned for promotional use of the aquaculture program.

Out-of-class Assignments

Students will be required to maintain the various recirculating aquaculture systems and mentor aquaculture, aquarium and horticulture students working in the aquaculture facility outside of lab class.

Demonstration of Critical Thinking

As a living educational tool where many things often can and do go wrong, students must constantly critically evaluate the recirculating aquaculture systems for equipment failures, water quality issues, and organism health concerns. Students must use the information they receive visually or from test kits and probes to determine why the issue is

occurring and what is the best way to address the problem. Instructor will evaluate the student s identification, explanation, and action to correct the issue.

Required Writing, Problem Solving, Skills Demonstration

Students will be evaluated by their contribution to the aquaculture journal and writing materials they produce for the aquaculture program as well as their continued ability to demonstrate proper techniques and identify/address potential problems.

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required.

Other Resources

1. Instructor handouts.