MRSC A120: MARINE AQUARIUM SCIENCE

Item	Value
Curriculum Committee Approval Date	11/16/2022
Top Code	040100 - Biology, General
Units	2 Total Units
Hours	54 Total Hours (Lecture Hours 27; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Introduces students to the science involved in aquarium keeping and provides experience working in a small public aquarium, under the supervision of the instructor and designated student aquarium managers. Students will learn basics of animal husbandry, disease control, aquarium water chemistry, methods of filtration, feeding, and aquarium maintenance. ADVISORY: MRSC A100 or MRSC A100H. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Identify the key components of aquarium life support systems and describe the function of individual components.
2. Understand how water quality parameters can change in aquaria and identify occurrences that may be responsible for these changes as well as specific actions that can improve general water quality.
3. Accurately identify the main principles in aquarium husbandry. Describe how these principles can help aquarist better care for fish, invertebrates, and algae in their systems.

Course Objectives

- 1. Describe the characteristics (physical and chemical) of closed tropical and temperate aquarium systems.
- 2. Describe and explain the components of mechanical, chemical, and biological filters.
- 3. Use basic water testing methods and kits to determine the salinity, pH, dissolved oxygen, temperature, nitrate, and ammonia levels of water in aquariums.
- 4. Determine the husbandry characteristics of species of marine fish and invertebrates based on their general characteristics.
- 5. Keep records properly as part of aquarium management.
- 6. Detect and treat diseases in fish and invertebrates.
- 7. Describe the differences between large private and public saltwater aquarium systems.
- 8. Knowledgeably discuss and practice management skills, interpersonal relations, and promotion of better work practices in a public aquarium setting.
- 9. Set up, fill, landscape, stock, and maintain a seawater aquarium.

Lecture Content

Orientation to existing O.C.C. Public AquariumGeneral aquaria characteristicsFoods FeedingTypes of Aquarium SystemsMinimum Equipment NeedsTypes of FiltersWater ChemistryAquarium MaintenanceMarine AlgaeField Trip to the Ocean Institute or similar InstituteAquarium Husbandry, Common Marine OrganismsThe Role of Aquaria in Species Enhancement ProgramsHealth DiseaseField Trip to Cabrillo Marine or similar Aquarium

Lab Content

Orientation to existing O.C.C. Public AquariumGeneral aquaria characteristicsFoods FeedingTypes of Aquarium SystemsMinimum Equipment NeedsTypes of FiltersWater ChemistryAquarium MaintenanceMarine AlgaeField Trip to the Ocean Institute or similar InstituteAquarium Husbandry, Common Marine OrganismsThe Role of Aquaria in Species Enhancement ProgramsHealth DiseaseField Trip to Cabrillo Marine or similar Aquarium

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

1. Lecture and power point presentations of application of ideas related to aquarium management, care, construction, and maintenance. 2. Discussion and aquarium managers demonstration of methods of water testing and evaluation. 3. Individual, paired, and small group exercises involving theoretical aquarium problems and emergencies. 4. Peer feedback from aquarium managers during feeding, cleaning, moving specimens, collecting, and obtaining replacement seawater. 5. At least one field trip to local large public aquariums with tours of each facility.

Reading Assignments

Reading from assigned OCC Aquarium Procedure Manual and/or aquarium training videos with recommonded supplematary readings. 1 hr/week.

Writing Assignments

Students must keep a journal documenting their progress and learning in this class, 1 hr/week.

Out-of-class Assignments

Students will be required to maintain the various aquarium systems outside of lecture class. 2 hrs/wk

Demonstration of Critical Thinking

Midterm and comprehensive final exam, weekly quizzes over lectures, journal keeping, and skills demonstration (including ability to perform pH, salinity, dissolved oxygen, temperature, and nitrogen tests; carry out water changes and additions of freshwater to systems to correct salinity problems, demonstration of ability to feed fish, clean tanks correctly, set up displays, and quarantine or treat sick and diseased fish and invertebrates).

Required Writing, Problem Solving, Skills Demonstration

Quizzes, the midterm and final exam all have significant written components. In addition, students are required to keep a journal documenting aquarium characteristics, species information and their progress and learning.

Eligible Disciplines

Biological sciences: Masters degree in any biological science OR bachelors degree in any biological science AND masters degree in biochemistry, biophysics, or marine science OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Fenner, Robert. The Conscientious Marine Aquarist, ed. Vermont: Microcosm, Shelburne, 2008 Rationale: This is the only book written that covers the appropriate material regarding the science of aquarium keeping. The technology and equipment has changed, but, the science is the same.

Manuals Resources

1. OCC Aquarium. OCC Aquarium Procedure Manual, OCC Aquarium , 08-05-2020