

AQUA-5: Principles of Mariculture

Course Information

Semester & Year: Fall 2024

Course ID & Section #: AQUA-5-E8391

Instructors Name: Jasmine Iniguez

Day/Time of required meetings: M 2:00 -4:05 PM

Lab: W 2:00 PM – 5:10 PM

Location: LEC: AT 132; LAB HU125

Course units: 3

Instructor Contact Information

Office location: SCI 216I

Office hours: In person by appointment or via ZOOM

Phone number: (707) 476-4528

Email address: jasmine-iniguez@redwoods.edu

Catalog Description

This course is designed to provide students with the general overview of marine aquaculture, the cultivation of marine aquatic organisms. Students will explore aquaculture principles and practices for producing shellfish, seaweed, urchins, abalone, and various marine finfish species. Students will learn to cultivate live feed including microalgae and artemia. This course will cover the economic implications for producing sustainable marine-sourced foods. This course will include in-class lectures, hands-on lab exercises, and field trips with local hatchery and mariculture facilities.

Course Student Learning Outcomes

1. Apply the concepts of culturing, breeding, growing, and harvesting various mariculture species to different production systems.
2. Understand and discuss the importance of mariculture for building coastal communities, improving environmental ecosystems, and supplying healthy seafood.

Prerequisites/corequisites/ recommended preparation

None

Recommended Course Textbook

Aquaculture: Farming Aquatic Animals and Plants, 3rd Edition

Author: John S. Lucas & Paul C. Southgate

Publisher: Wiley-Blackwell

ISBN: 9781119230861

A Field Guide to Seaweeds of the Pacific Northwest

Author: Dr. Bridgette Clarkston

Harbour Publishing

ISBN: 978-1-55017-703-9

Molluscan Shellfish Aquaculture: A Practical Guide, 2021

Author: Sandra Shumway

Publisher: 5m Books

ISBN: 978-1789180107

Plankton Culture Manual, 6th Edition, 2007

Author: Frank H. Hoff, Terry W. Snell

Publisher: Florida Aqua Farms Inc

ISBN: 978-0966296044

Supplemental References:

Southern Regional Aquaculture Center Fact Sheets: <https://srac.tamu.edu/>

Evaluation & Grading Policy

Grading:

Course Requirements	Percent of Total Grade	Due Date
Exam 1	20	Monday, Sept 30
Exam 2	20	Monday, Nov 18
Final Exam	20	Monday, Dec 16
Research Paper	15	Friday, Dec 6
Quizzes	5	Mondays
Mariculture Project	15	Wednesday, Dec 11
Participation (attendance taken into account)	5	

CR has a set policy for how course percentages convert to grades:

A > 92%; A- 90-92%; B+ 87-89%; B 83-86%; B- 80-82%; C+ 77-79%; C 70-76%; D 60-69%; F

Late Assignments:

Each student is responsible for completing all assignments and activities as specified by the instructor by the date indicated. Please stay on task, as late assignments will be penalized and loose 5% for each day they are late. If you have an emergency (e.g. hospitalization, death in the

family, car accident) please notify me as soon as you can if this affects your coursework or attendance. Please contact me immediately if something in the foreseeable future is approaching as well.

Exam Make-up Policy:

This class will have a total of three exams (100 points each), which make up 60% of your grade! The course is broken up into three units. These three units make up each exam, which means the exams are not cumulative, but some topics may be repeated, and you may see them on other exams. The final is not cumulative. **You must have a serious and verifiable excuse to miss a lecture exam. If you have an emergency (hospitalization, family/friend death, car accident, quarantine) please notify me as soon as you can if this affects your ability to take the exam on the scheduled date.** Please contact me 12 hours in advance if something in the foreseeable future is approaching as well. If you do not notify me and or do not provide a legitimate excuse an automatic 10% will be taken from your makeup exam.

Quizzes:

You will have a set of open note quizzes. These are designed to help you prepare for the exams.

Mariculture Research Paper:

Students are required to write a literature review research paper describing one cultured **marine** aquaculture species of their choice.

FORMAT:

- MLA Format
- Submit in Word document NOT pdf so I can make suggestions via track changes
- Typed with 12- point Font in Times New Roman
- Double spaced
- 4-6 pages in Length
- At least 5 peer-reviewed references should be cited from a research journal.
- Pictures, diagrams, and tables are highly encouraged but *not* required. They will not count towards page requirements.

OUTLINE:

- I. Introduction
- II. Life History
- III. Water Quality Requirements
- IV. Reproduction and Larval Culture
- V. Production Methods (Techniques and Systems used)
- VI. Nutritional Requirements
- VII. Disease
- VIII. Future Directions for the Industry
- IX. References

References: Utilize google scholar (<https://scholar.google.com/>) to search for academic journals. If there is a research manuscript you are unable to access, please let me know. I may be able to get it for you.

DUE DATES: (Submit via Canvas)

Friday, Sept 13: Topic identified on discussion board

Friday, Oct 11: Outline

Friday, Nov 15: Rough Draft

Friday, Dec 6: Final Draft

Wednesday, Dec 11: Poster Presentation

Field Trips:

- **Friday Sept 6 – Sunday 8th:** Moss Landing and Monterey with Cal Poly Humboldt
- **Wednesday, November 14:** Bakers Beach, Seaweed Sampling and Identification
- **TBA:** Sunken Seaweed
- **TBA:** Hog Island Oyster
- **Tentative Date:** Cal Poly Humboldt Marine Lab

NOTE: CR does not provide transportation so therefore students are expected to provide their own for traveling for field trips. Please consider carpooling with each other!

Tentative Course Schedule

AQUA 5: Principles of Mariculture <°))>{			
Date	Week 1	Lecture and Lab Exercise:	Textbook & Chapter
26- Aug	M- LEC	Course Overview and Navigation Introduction to Mariculture and Historical State	Lucas et al. Ch. 1 Tidwell, Ch. 1
28- Aug	W- LAB	Lab Overview, Field Trip Logistics, Mariculture Proj.	
	Week 2		
2-Sep	M- LEC	NO CLASS - Labor Day	No Class
4-Sep	W- LAB	Mariculture Production Systems, Design, Plumbing	Lucas et al. Ch.
6-Sept	Friday	Field Trip to Moss Landing!	
	Week 3		
9-Sep	M - LEC	Water Quality	Lucas et al., Ch.4
11-Sep	W - LAB	Water Quality Assessment using HACH	Lucas et al., Ch.4
	Week 4		
16-Sep	M - LEC	Nutrition and Feed– Marine Species Requirements	Lucas et al., Ch.8
19-Sep	W - LAB	Live Feeds and Counts	
	Week 5		
23-Sep	M – LEC	Bivalve and Mollusk (Geoduck) Culture	Lucas et al. Ch 24
25-Sep	W – LAB	Hog Island Oyster Tour	
	Week 6		

30- Sep	M	Exam 1	
2- Oct	W	Sunken Seaweed Tour	
	Week 7		
7-Oct	M	Seaweed and Kelp Aquaculture	Lucas et al. Ch. 15
9-Oct	W	IMTA and Construction for Seaweed Festival	Lucas et al. Ch. 8/15
	Week 8		
14-Oct	M	Algal Culture (micro and macro)	Lucas et al. Ch. 9
16- Oct	W	Algal Culture and Counts	
19-Oct	Sat	California Seaweed Festival – Volunteer!	
	Week 9		
21-Oct	M	Sablefish and Red Drum Culture	Lucas et al. Ch. 20
23 Oct	W	Trinidad Marine Lab Guided Tour @ 3:30ish	
	Week 10		
28- Oct	M	Abalone and Echinoderm Culture	Lucas et al. Ch. 25
30-Oct	W	Urchin Spawning Experiment	
	Week 11		
4-Nov	M	Exam 2 Review	
6- Nov	W	TBA – Work on Project	
	Week 12		
11- Nov	M	No Class- Veterans Day	No Class
13-Nov	W	Seaweed Sampling and ID @ Bakers Beach	
	Week13		
18-Nov	M	Exam 2	
20-Nov	W	RAS System and Yellow Tail Kingfish Production	Tidwell, Ch.11
	Week 14		
25- Nov	M	Fall Break	
27- Nov	W	Fall Break	
	Week15		
2- Dec	M – LEC	Aquarium Industry and Ornamental Fish Culture	Lucas et al. Ch. 26
4-Dec	W – LAB	Future of Mariculture Boat Knots and Chucking	Lucas et al. Ch. 27
	Week 16		
9-Dec	M – LEC	Final Exam Review	
11-Dec	W - LAB	Aquaculture Symposium – Project Presentations	
	Week 17		
16-Dec	M	Final Exam @ 3:15 – 5:15PM	
18-Dec	W	NO CLASS – Best of luck on finals! 😊	

Fall 2024 Dates

Date	To Remember
August 23	Last day to register for classes (day before the first-class meeting)
August 24	Classes begin
August 30	Last day to add a class
September 2	Labor Day Holiday (district wide closure)
September 6	Last Day to Drop & Receive a Refund
September 8	Last Day to Drop w/out a "W"
September 9	Census Date (20% of class)
October 31	Last Day to Petition to Graduate & Petition for Certificate
November 1	Last Day for Student/Faculty Withdrawal
November 11	Veteran's Day Holiday (District Wide Closure)
November 25-26	Fall Break (No Classes)
November 27-29	Thanksgiving Holiday (District Wide Closure)
December 14-20	Final Examinations
December 20	Last Day to File P/NP Option
December 20	Semester Ends
December 27	Grades Due
January 3	Grades Available for Transcript Release

Educational Accessibility & Support

College of the Redwoods is committed to providing reasonable accommodations for qualified students who could benefit from additional educational support and services. You may qualify if you have a physical, mental, sensory, or intellectual condition which causes you to struggle academically, including but not limited to:

- Mental health conditions such as depression, anxiety, PTSD, bipolar disorder, and ADHD
- Common ailments such as arthritis, asthma, diabetes, autoimmune disorders, and diseases
- Temporary impairments such as a broken bone, recovery from significant surgery, or a pregnancy-related disability
- A learning disability (such as dyslexia, reading comprehension), intellectual disability, autism, or acquired brain injury
- Vision, hearing, or mobility challenges

Available services include extended test time, quiet testing environments, tutoring, counseling and advising, alternate formats of materials (such as audio books or E-texts), assistive technology, on-campus transportation, and more. If you believe you might benefit from disability- or health-related services and accommodations, please contact [Student Accessibility Support Services \(SASS\)](#). If you are unsure whether you qualify, please contact SASS for a consultation: sass@redwoods.edu.

SASS office locations and phone numbers

Eureka campus

- Phone: 707-476-4280
- Location: Student Services Building, first floor

Del Norte campus

- Phone: 707-465-2324
- Location: Main Building, next to the library

Klamath-Trinity campus

- Phone: 707-476-4280

Student Support Services

Good information and clear communication about your needs will help you be successful. Please let your instructor know about any specific challenges or technology limitations that might affect your participation in class. College of the Redwoods wants every student to be successful.

The following online resources are available to support your success as a student:

[CR Online Learning Support](#)

Tech support, laptop loans, guides to using Canvas, installing Office 365 for free, and more.

[Library Articles & Databases](#)

Find the best library databases for your research.

[Online Tutoring Resources](#)

Participate in tutoring over Zoom.

To learn more about the resources available to you, click on a title bar below, or click the down arrow to expand them all.

Klamath-Trinity students can contact the CR Klamath-Trinity Office for specific information about student support services at 530-625-4821.

Community College Student Health and Wellness

National Suicide Prevention Lifeline

If you are in distress or are with someone at risk right now, call or text the National Suicide Prevention Lifeline.

Call the National Suicide Prevention Lifeline

1-800-273-TALK (8255)

Text the National Suicide Prevention Lifeline

741-741

Timely Care

When you're not feeling well physically or distressed mentally, Timely Care can offer the help you're looking for in just a few quick taps. Students can schedule an appointment anytime via phone, video, and chat. [Log in or set up an account with Timely Care](#).

Mental Health Counseling

Students should text, email, or fax Shawna Bell directly for scheduling and/or services.

- Text: 707-496-2856
- Email: shawnabmft@gmail.com
- Fax and voicemail: 707-237-2318

Wellness Central

Resources, tools, and trainings regarding health, mental health, wellness, basic needs and more designed for California community college students, faculty and staff are available on the California Community Colleges [Wellness Central](#).

Counseling

[Counseling and Advising](#) can assist students in need of academic advising and professional counseling services. Call, email or stop by one of our offices to make an appointment!

Counseling and Advising office locations and contact info

Eureka campus

- Phone: 707-476-4150
- Location: Student Services Building, first floor
- Email: counseling@redwood.edu
- Hours: Monday through Friday, 9am to 4pm. Summer hours may vary

Del Norte campus

- Phone: 707-476-2300
- Location: Main Building, next to the library
- Hours: Summer hours may vary

Klamath-Trinity campus

- Phone: 530-625-4821
- Email: KT-staff@redwoods.edu
- Hours: Summer hours may vary

Basic Needs Center

[The Basic Needs Center](#) provides for the health and safety of students by providing access to healthy food, financial resources, and referrals to safe and secure housing. [Submit a request for services and information](#).

Basic Needs Center contact info

- Phone: 707-476-4153
- Email: the-grove@redwoods.edu

Learning Resource Center

The Learning Resource Center includes the following resources for students:

Library Services

[Library Services](#) promotes information literacy and provides organized information resources.

Multicultural and Equity Center (MCE)

The [Multicultural and Equity Center](#) is a dynamic and inclusive place that supports all students in their academic and personal journeys at the college. We do this by creating community, home away from home, and a safe place for cultural expression, cross-cultural learning, access to college and dignity resources, and social justice work opportunities. The MEC is committed to retention and student success by offering activities related to leadership development, student connectedness and student equity. We are a student-centered program that fosters respect for all people.

Academic Support Center

The [Academic Support Center](#) offers tutoring and test proctoring for CR students.

Student Tech Help

[Student Tech Help](#) provides students with assistance around a variety of tech problems.

Extended Opportunity Programs and Services (EOPS)

[Extended Opportunity Programs and Services](#) (EOPS) provides services to eligible income disadvantaged students including textbook awards, grants, career academic and personal counseling, transportation assistance, tutoring, laptop, calculator and textbook loans, priority registration, graduation cap and gown, workshops, and more!

TRiO Student Success Program

The TRiO Student Support Services Program provides eligible students with a variety of services including academic advising, career assessments, assistance with transfer, and peer mentoring. Students can apply for the program with the [Eureka TRiO office](#) or the [Del Norte TRiO office](#).

Veterans Resource Center

The [Veteran's Resource Center](#) supports and facilitates academic success for Active Duty Military, Veterans and Dependents attending CR through relational advising, mentorship, transitional assistance, and coordination of military and Veteran-specific resources.

CalWORKS

California Work Opportunity & Responsibility to Kids ([CalWORKs](#)) provides supportive services to student parents with children under the age of 18, who are receiving cash assistance (TANF benefits), to become self-sufficient. Services include: transportation assistance, basic student supplies, tutoring, priority registration, laptop and calculator loans, career, academic, and personal counseling, and more!

Academic dishonesty

In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the student's status in the course is left primarily to the discretion of the faculty member. In such cases, where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct ([AP 5500](#)) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the [2023-2024 College Catalog](#) and [CR Board and Administrative Policies](#).

AI Use Class Policy

Recent advancements in generative artificial intelligence (AI) have made large language models such as ChatGPT and Google's Bard widely available. Sometimes, using these tools appropriately can help us overcome barriers and allow us to focus on deeper learning. However, overuse of these tools can undermine the development of our critical and creative thinking skills. In addition, AI outputs are often unreliable and frequently subject to bias. For these reasons, it is sometimes appropriate and sometimes inappropriate to use generative AI in the completion of assignments or in discussion posts. For this class, please see the specific assignment instructions for guidance on how and when generative AI tools may be used appropriately as we're working on and learning from a particular assignment. Also, please keep in mind that you are responsible for anything you submit; please carefully review all AI-generated outputs, screening them for accuracy, bias, appropriateness, and fidelity to your perspective.

Disruptive Behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process, a disruptive student may be temporarily removed from class. In addition, the student may be reported to the Chief Student Services Officer or designee. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the [2023-2024 College Catalog](#) and [CR Board and Administrative Policies](#).

Inclusive Language in the Classroom

College of the Redwoods aspires to create a learning environment in which all people feel comfortable in contributing their perspectives to classroom discussions. It therefore encourages instructors and students to use language that is inclusive and respectful.

Canvas Information

- Log into Canvas at [My CR Portal](#)
- For help logging in to Canvas and general tech help, visit [Student Technical Support](#)
- Once you're logged in to Canvas, you click on the Help icon on the left menu
- Canvas online orientation workshop: [Canvas Student Orientation Course](#)

Setting Your Preferred Name and Pronouns in Canvas

Students have the ability to display personal pronouns and an alternate first name in Canvas. Students may change their pronouns on their own in Canvas (Account :: Settings :: Edit Settings). To request a change to your preferred list name, contact [Admissions & Records](#). Your Preferred Name will only be listed in Canvas; this does not change your legal name in our records. See the [Student Information Update Form \(pdf\)](#).

Emergency Procedures / Everbridge

College of the Redwoods has implemented an emergency alert system called Everbridge. In the event of an emergency on campus you will receive an alert through your personal email and/or phones. Registration is not necessary in order to receive emergency alerts. Check to make sure your contact information is up-to-date by logging into [WebAdvisor](#) and selecting 'Students' then 'Academic Profile' then 'Current Information Update.'

Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions. For more information visit [Redwoods Public Safety](#).

In an emergency that requires an evacuation of the building anywhere in the District:

- Be aware of all marked exits from your area and building
- Once outside, move to the nearest evacuation point outside your building
- Keep streets and walkways clear for emergency vehicles and personnel

Do not leave campus, unless it has been deemed safe by the campus authorities.

To learn more about campus-specific Emergency Procedures, click on a title bar below, or click the down arrow to expand them all.

Del Norte Campus Emergency Procedures

Please review the [Crescent City campus emergency map](#) for campus evacuation sites, including the closest site to this classroom (posted by the exit of each room). For more information, visit [Redwoods Public Safety](#).

Klamath-Trinity Campus Emergency Procedures

Please review the responsibilities of, and procedures used by, the College of the Redwoods, Klamath Trinity Instructional Site (KTIS) to communicate to faculty, staff, students and the general public during an emergency. It is the responsibility of College of the Redwoods, Klamath-Trinity Instructional Site (KTIS) to protect life and property from the effects of emergency situations within its own jurisdiction. In the event of an emergency, communication shall be the responsibility of the district employees on scene:

1. Dial 911, to notify local agency support such as law enforcement or fire services.
2. If safe to do so, notify key administrators, departments, and personnel.

3. If safe to do so, personnel shall relay threat information, warnings, to ensure the school community is notified.
4. Contact 530-625-4821 to notify of situation.
5. Contact Hoopa Tribal Education Administration office 530-625-4413
6. Notify Public Safety 707-476-4111.

In the event of an emergency, the responsible district employee on the scene will:

1. Follow established procedures for the specific emergency as outlined in the College of the Redwoods Emergency Procedure Booklet.
2. Lock all doors and turn off lights if in lockdown due to an active shooter or similar emergency.
3. Close all window curtains.
4. Get all inside to safe location Kitchen area is best internal location.
5. If a police officer or higher official arrives, they will assume command.
6. Wait until notice of all is clear before unlocking doors.
7. If safe to do so, move to the nearest evacuation point outside building (Pooky's Park), directly behind the Hoopa Tribal Education Building.
8. Do not leave site, unless it has been deemed safe by the person in command.