

AQUA-4: Salmonid Aquaculture

Course Information

Semester & Year: Fall 2024

Course ID & Section #: AQUA-4-E7418

Instructor's name: Jasmine Iniguez

Class Days/Time:

LECTURE: T/TH 12:40 – 1:45 PM

Location: AT108

LAB: TH 8:30 AM -11:40 AM

Location: AT 108

Course units: 3

Instructor Contact Information

Office location: SCI 216I

Office hours: By appointment or via zoom

Phone number: (707) 476-4528

Email address: jasmine-iniguez@redwoods.edu

Except a 24-hour turnaround time for response to emails (M-F)

Catalog Description

This course is designed to give students a general understanding of salmonid biology and the principles for culturing various salmonid species. The course will cover water quality criteria, nutritional requirements, feeding practices, reproduction, and common diseases. Students will learn about land-based and offshore production technologies associated with the production of high-quality fish for market. Laboratory experiences will focus on the management of local salmonid hatcheries and aquaculture facilities.

Course Student Learning Outcomes

1. Research, design, communicate, and apply the principles of salmonid aquaculture to create, operate, and manage elements of broodstock and early rearing techniques within legal, social, economic, and environmental contexts.
2. Demonstrate an understanding of the principles of harvesting, handling, and processing of salmonids to ensure the highest flesh quality is met for marketing purpose.

Prerequisites/corequisites/ recommended preparation

AQUA-1: Intro to Aquaculture or Instructors approval

Required Course Textbook

Trout and Salmon Culture (Hatchery Methods)

Author: Earl Leitritz and Robert C. Lewis

Publisher: **California Fish Bulletin 164**

ISBN0-931876-36-2

ebook FREE access at: <https://escholarship.org/uc/item/6xh0k539#author>

Salmon Farming

Author: Odd-Ivar **Lekang**

Publisher: 5m Books

Trout Farming Handbook, 6th edition

Author: Stephen Drummond **Sedgwick**

Publisher: Fishing News Books

ISBN: 978-0852382325

Supplemental Course Material

CH. 15 Salmonids

Aquaculture: Farming Aquatic Animals and Plants 3rd ed

Author: John S. Lucas, Paul Southgate, and Craig Tucker

Available on canvas!

Southern Regional Aquaculture Fact Sheets <https://srac.msstate.edu/publications.html>

Evaluation & Grading Policy

Grading:

Course Requirements	Percent of Total Grade	Due Date
Exam 1	20	Tuesday, Oct 1
Exam 2	20	Tuesday, Nov 12
Final Exam	20	TBA
Research Paper	15	Friday, Dec 6
Lab Reports/Worksheets	10	TBA
Lab Practical	10	Thursday, Dec 12
Participation (attendance considered)	5	

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.

Salmonid Research Paper:

Students are required to write a literature review research paper describing one cultured salmon or trout 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. Environmental Concerns
- X. 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

Field Trips and Lab Exercises

- Scotia Fisheries Exhibit
- Smith River Weekend Camping Trip: Overnight weekend camping trip doing a snorkel survey at the Smith River combined with AQUA-3: Intro to Fisheries scheduled for Saturday Sept 28th coming back Sunday, 29th. In this trip students will snorkel, assess habitat structure, conduct water quality, and collect macroinvertebrates
- Cal Poly Fish Hatchery – Reproduction Assessment using Ultrasonography
- Cal Poly Fish Hatchery – Calculate Feed Rates
- Cal Poly Humboldt Fish- PIT and Floy Tagging Techniques

Tentative Course Schedule:

AQUA 4: Salmonid Aquaculture				
Date	Week 1	Lecture Topic, M/W 9-10:05am	Lab W 10:30 - 1:30 PM	Textbook Reference
27-AUG	T	Course Overview and Intro to Aquaculture	Microscopes Aging Using a Scale	FAO
29-AUG	TH	Introduction & Status of Salmonid Industry		CH 2 & 3 Lekang
	Week 2			
3-SEP	T	Salmonid Life Biology - Homing & Smoltification	Scotia Fisheries Exhibit	CH 4. Lekang
5-SEP	TH	Salmonid Identification		CH. 1 Sedgwick
	Week 3			
10-SEP	T	Alder Grove High School System Build	Pond Size Calculation Tank & System Calculations	
12-SEP	TH	Salmon Production Methods		CH. 8 Lekang
	Week 4			
17-SEP	T	Trout Production Methods	Water Quality Assessment	CH. 5-9 Sedgwick
19-SEP	TH	Water Quality and Requirements		Fish Bulletin. Pg. 9-21
	Week 5			
24-SEP	T	Nutritional Requirements and Feeding Practices	NO LAB! Weekend Field Trip to Smith River	CH. 10. Lekang
26-SEP	TH	Exam 1 Review		
	Week 6			
1-OCT	T	EXAM 1		
3-OCT	TH	Health and Disease	Disease Treatments and Microscopes	CH 11. Lekang CH. 12. Sedgwick Fish Bulletin: Pg. 138-172
	Week 7			
8-OCT	T	Broodstock Selection and Management	Cal Poly Humboldt Ultrasound Examination	CH. 5 Lekang
10-OCT	TH	Spawning Techniques & Fertilization		CH.5. Lekang Fish Bulletin Pg. 25-50
	Week 8			
15-OCT	T	Egg Development and Incubation	Counting Fish Eggs	CH. 6. Lekang Fish Bulletin Pg. 70-77
17-OCT	TH	Hatchery & Nursery Systems		CH. 7. Lekang

	Week 9			
22-OCT	T	Grow-Out Methods – Land Based & Offshore Farming	Cal Poly Humboldt Harvest numbers and Feeding Rates	CH. 8. Lekang
24-OCT	TH	Land Based System Design and Maintenance		CH. 10 Sedgwick
	Week 10			
29-OCT	T	Post Harvesting and Handling	Filleting and Processing	CH. 8 Lekang
31-OCT	TH	Processing		CH. 143 Sedgwick
	Week 11			
5-NOV	T	Marketing and Profits	Wild Vs. Farmed Salmon	CH. 15 Lucas et al.
7-NOV	TH	Exam 2 Review		
	Week 12			
12-Nov	T	EXAM 2	Cal Poly Humboldt Tagging Techniques	
14-NOV	TH	Aquaculture Based Fisheries		External Source
	Week 13			
19-NOV	T	Atlantic Salmon Aquaculture	Biosecurity Calculations	External Source
21-NOV	TH	Environmental Concerns: Pollution		External Source
	Week 14			
26-NOV	T	Fall Break	FALL BREAK	
28-NOV	TH	Fall Break		
	Week 15			
3-DEC	T	Environmental Concerns: Escapes & Biosecurity	Lab Review	External Source
5-DEC	TH	Regulations and Policy Salmon Farming		External Source
	Week 16			
10-DEC	T	Future Trends	Lab Practical	CH. 13 Lekang
12-DEC	TH	Final Exam Review		
	Week 17			
17-DEC	T	Finals Week	No Lab	
19-DEC	TH	Finals Week		

Educational Accessibility & Support

College of the Redwoods is committed to providing reasonable accommodation 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!

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

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. However, overuse of these tools in this class can undermine your learning and curtail the development of your critical and creative thinking skills. In addition, AI outputs are often unreliable and frequently subject to bias. For these reasons, the policy of this class is that AI cannot be used at any point in the completion of class assignments, including discussion posts. Any or all of your assignment submissions and discussion posts may be screened by AI detection software, but the real penalty for AI misuse is that you will miss out on an opportunity to learn.

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.