

Culture and Ecology of Southern Thailand: Islands, Reefs and Mangroves

Culture, Ecology, and Community Semester

Ecology / Geography

Short Name: Thai Culture & Coastal Ecology

Credits: 4

Course Description

The oceans and coastal ecosystems of Southeast Asia are among the most productive, and most threatened, on the planet. This advanced course examines coastal and island communities in Southern Thailand alongside the near-shore ecologies they inhabit — mangroves, seagrasses, and coral reefs — and the artisanal and commercial fisheries that connect them. Students engage with the competing stakeholders, overlapping resource claims, and mounting pressures of climate change, ocean acidification, and rising sea levels that make marine resource management a persistently contested endeavor.

The course has two parts: a Coastal Section on the fishing and mangrove communities of Koh Sukorn and the Trang mainland, who are working to conserve traditional livelihoods amid the expansion of shrimp farming, commercial fishing, and tourism; and an Islands Section on the coral reefs and state-managed marine parks of the Adang-Rawi archipelago, explored by sea kayak along the traditional routes of the Urak Lawoi, a semi-nomadic sea people, while examining reef ecology and its human impacts.

By its conclusion, students will understand the ecological interdependence of coral reefs, seagrass, and mangroves; the possibilities and limitations of both state and community-based marine management; and the broader challenges facing marginalized coastal communities in the context of a changing climate.

Course Objectives

The objectives for this course are to:

- Understand key threats to ocean and coastal ecosystems in Southern Thailand
- Understand the ecological interdependence of mangrove, seagrass, and coral reef ecosystems
- Gain hands-on experience with biological and social field research methods
- Understand the sociopolitical dynamics of marine resource management, and the struggles of marginalized coastal communities
- Articulate how these local challenges connect to global issues and climate change

Methodology

The course will integrate course lectures and readings with group discussions and seminars. Experiential field studies will be an important component of the course, both formal and informal. Guest lecturers will be a part of the course to share their experiences and perspective with students. Keeping up with readings, materials presented in class, and assignments is critical for success during this course.

Grading and Assessment

Component	Details	Total
Engagement	This means participation in and out of the classroom, being an active member of the course, and being fully present and engaged in the field. This includes participation in discussions during seminars and in the village, etc. This also means being an active and supportive member of the course, including as a designated leader and active follower/self leadership.	10
Writing	Seminar and Observation Notes (10): An important component of learning to observe and analyze the issues during this course is taking notes in class as well as an on-going daily journal of observations outside the classroom. Please put the date on top of each page. Field Research Notebook (15): A more structured way of taking notes and learning outside the classroom assigned to specific field studies. Essays (20): There are two (2) essays during the course. Essays should be 4-5 pages long in your field note journal, and cover the following points: • How this issue or topic links to the overall topic of the course. (1) • Why you are interested in this specific issue or topic. (1) • A description and analysis of the specific issue and why it is important. (5) • Reference to interviews or observations during the course. (2) • Other questions that this issue raises for you to explore further. (1)	45
Independent Field Research Project (IFRP)	Each student will choose an issue related to the course to study independently. This should be a combination of research, observations, and analysis of a topic that the student is interested in. The emphasis is primarily on field observations drawing on field studies as well as independent observations. This is not a book report or literature review, but field research. Students must receive instructor approval for their chosen topic/issue. Proposal (5): The IFRP proposal is a 1 page typed outline and a short presentation (~2 minutes) explaining the question, how it is related to the course topic, how data will be gathered, and any potential challenges you anticipate. Progress update (5): An update during mid-course on what has been discovered about the topic so far, what further questions this raises, any challenges and how they have been overcome, as well as further information to look for during the second half of the field study. 1 page written in your notebook as well as an in-class presentation. Final Presentation (15): On the last day of the course each student will give a five minute presentation on their research. Focus on clarity, field observations, interviews/discussions with community members, and analytical depth. 5-10 slides in PDF format. Organization for final presentation 1. What did you study/research focus? How is this related to the course topic? (2) 2. How did you study this, including observations and interviews? (4) 3. What did you learn? Findings and analysis. (7) 4. Further questions this raises for you. (1) 5. Final slide of references / interviews. (1)	25
Final Exam	The final exam will be a comprehensive review of course topics with an emphasis on what was learned during the field portion of the course. There will be 5 short answer questions. Students may use their notes but not their readers or the internet during the exam.	20
Total		100

Course Topics and Schedule

Readings are in the course reader. The readings are a resource for the seminars, field studies, and for your final presentation. There are a lot of readings the first week, which you will refer to later on during the field section of the course. Be strategic in your reading so that you focus on new materials and information, and then go back and dive deeper into the readings as needed.

Schedule Overview

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
AM: Thai Class PM: Ecosystem and Environmental Overview	AM: Thai Class PM: Threats to Marine Ecosystems 1	AM: Thai Class PM: Threats to Marine Ecosystems 2	AM: Thai Class PM: Ocean Governance	AM: IFRP Proposal, Resource Management	Off	AM: CNX to Krabi, Travel from Krabi to Koh Sukorn PM: Mudflat (FRN: ZS,BS,CS)
	Day 1 AM: Travel from Chiang Mai to Krabi, to Koh Sukorn PM: Mudflat survey (FRN: ZS,BS,CS)	Day 2 AM: Village Survey & Fisheries Survey PM: Community-based tourism and conservation talk	Day 3 AM: Observe Fishing Activity on long tail boats PM: Community-based enterprise (Klang Leh)	Day 4 AM: Travel from Koh Sukorn to Bohin Homestay PM: Seagrass & Mudflat survey @ Pak Klong (FRN: BS,TS,ZS)	Day 5 AM: Rubber Planting Survey & gear check (kayak) PM: Community-based enterprise discussion (Khun Banjong)	Day 6 Mangrove Channel Survey (FRN) — all day
Day 7 AM: DMCR Administrative Unit PM: Small-scale fisheries at Toh Ban Pier	Day 8 AM: DMCR Research Unit PM: Discuss with women's group & Natural Tie Dye	Day 9 AM: Commercial Fishing Study at Kan Tang Port In/Port Out office PM: Discussion with Department of Fishery (Sikao District) ESSAY #1 DUE 5 PM	Day 10 AM: Travel from mainland to Pakbara, to Koh Lipe PM: Gear checking & intro snorkeling & swim assessment IFRP PROGRESS UPDATE DUE (mid-course)	Day 11 AM: Intro to sea kayaking & swim assessments PM: Talk with Urak Lawoi elders	Day 12 AM: Paddle day: Lipe to Talo Puya PM: Camp at Talo Puya	Day 13 AM: Paddle day: Talo Puya to Hat Sai Khao PM: Coral Reef: Hat Sai Khao (FRN: TS,ZS,CS)
Day 14 AM: Paddle day: Hat Sai Khao to Talo Palien PM: Trash transect study (FRN: TS)	Day 15 AM: Coral reef FRN at Talo Palien (CS,TS,BS) PM: Independent Study	Day 16 AM: Coral reef: Koh Yang & Jabang Channel (FRN: CS,BS) & Hat Jalakay (FRN: ZS,BS) PM: Independent Study	Day 17 AM: Paddle day: to Adang NP PM: Talk with Adang National Park scientist	Day 18 AM: Adang NP to Koh Lipe, clean and store gear/kayaks PM: Urak Lawoi youth discussion	Day 19 AM: Travel from Lipe back to Chiang Mai ESSAY #2 DUE 5 PM	Day 20 AM: Final Exam PM: IFRP Presentation, Clean and Return Gear FRN & PRESENTATION SLIDES DUE

Module 1: Seminar Week — Theory & Foundations

Monday

Ecosystem and Environmental Overview

Readings

- Levinton, Jeffrey, *Marine Biology: Function, Biodiversity, Ecology*, Oxford University Press, New York, 2018. Chapter 2: The Oceanic Environment, pp. 12-32.
- Levinton, Jeffrey, *Marine Biology: Function, Biodiversity, Ecology*, Oxford University Press, New York, 2018. Chapter 4: Ecological and Evolutionary Principles of Marine Biology, pp. 46-73.

Tuesday

Threats to Marine Ecosystems — Climate Change and Pollution

Readings

- Levinton, Jeffrey, *Marine Biology: Function, Biodiversity, Ecology*, Oxford University Press, New York, 2018. Chapter 3: Climate Oscillations and Climate Change, pp. 33-45.
- Lehmköster, J., et al. *World Ocean Reviews: The Ocean – A Climate Champion, How to Boost Marine Carbon Dioxide Uptake*. Maribus, Hamburg, 2024, pp. 96-121. Chapter 5: More Carbon Sequestration in Marine Meadows and Forest
- Kelsey R., et al., *Understanding Cause of Gear Loss Provides a Sound Basis for Fisheries Management*. *Marine Policy*, 96, pp 278-284, 2018.

Wednesday

Threats to Marine Ecosystems — Illegal, Destructive Fishing and Overfishing

Readings

- Pitcher, Tony J., & WL Cheung. "Fisheries: Hope or despair?," *Marine Pollution Bulletin*, Vol. 74.2: 506-516, 2013.
- Lehmköster, J., et al. "Illegal Fishing – The Fisheries of the Future," *World Ocean Reviews: Living with the Ocean 2*. Maribus, Hamburg, 2013, pp.70-97.

Thursday

Ocean Governance

Readings

- Lehmköster, J., et al. *World Ocean Reviews: Living with the Ocean 9: Marine Biodiversity – Vital Essence of Our Oceans*. Maribus, Hamburg, 2026. Chapter 7: When marine sanctuaries benefit biodiversity, pp.136-159.
- Lehmköster, J., et al. "The Future of Fish – The Fisheries of the Future," *World Ocean Reviews: Living with the Ocean 2*. Maribus, Hamburg, 2013, pp.108-119.
- Fabinyi Michael et al., *Coastal Transition: Small scale Fisheries, Livelihoods, and Maritime Zone Developments in Southeast Asia*. *Journal of Rural Studies* 91 (2022) 184-194.

Friday

Resource Management — Coastal Livelihood Approach

Readings

- Newell et al., *The Potential for Locally Managed Marine Area (LMMAs) as a Participatory Strategy for Coastal and Marine Ecosystems – the Global Commons*. *OIDA International Journal of Sustainable Development*, 12:04, pp.48-62, 2019.
- Reid, Hannah, "Ecosystem-and community-based adaptation; learning from community-based natural resources management," *Climate and Development*, 8:1, 4-9, 2015.

IFRP PROPOSAL DUE @ 8 AM; Present in Class

Module 2: Coastal Communities — Koh Sukorn

Due to the inherent unpredictability of the marine/ocean environment, the schedule for this field expedition has to be flexible. (For example, mudflat studies need to take place during low tides, etc.) Daily activities will be decided on in advance based on the tides, wind, waves, currents, and weather conditions.

Field Activities Disclaimer: Activities may be added or dropped depending on availability of local stakeholders as well as the wind, waves, weather, and tides.

Day 1 - Monday

AM: Travel from Chiang Mai to Krabi (Krabi to Koh Sukorn – port comparison)

PM: Mudflat survey – FRN: ZS, BS, CS

Day 2 - Tuesday

AM: Village Survey & Fisheries Survey

PM: Community-based tourism management and conservation talk with Khun Ball

Day 3 - Wednesday

AM: Observe Fishing Activity on long tail boats

PM: Community-based enterprise (Klang Leh)

Module 3: Mangroves, Rubber & Fisheries Governance — Bohin & Mainland Communities

Day 4 - Thursday

AM: Travel from Koh Sukorn to Bohin Homestay

PM: Seagrass & Mudflat survey @ Pak Klong – FRN: BS, TS, ZS

Day 5 - Friday

AM: Rubber Planting Survey & Gear check (Prepare Kayak)

PM: Community-based enterprise discussion with Khun Banjong

Day 6 - Saturday

All day: Mangrove channel survey – FRN

Day 7 - Sunday

AM: Department of Marine and Coastal Resources (DMCR) administrative unit

PM: Small-scale fisheries, Toh Ban Pier

Day 8 - Monday

AM: Department of Marine and Coastal Resources (DMCR) research unit

PM: Discuss with women's group & Natural Tie Dye

Day 9 - Tuesday

AM: Commercial Fishing Study at Kan Tang Port In - Port Out Office

PM: Discussion with Department of Fishery (Sikao District)

ESSAY #1 DUE @ 5 PM

Module 4: Islands & Reef Ecology — Tarutao/Adang-Rawi Archipelago

Day 10 - Wednesday

AM: Travel from mainland to Pakbara, to Koh Lipe

PM: Gear checking & intro snorkeling & swim assessment

IFRP PROGRESS UPDATE DUE @ 9 AM (mid-course); Present in Class

Day 11 - Thursday

AM: Intro to sea kayaking & swim assessments
PM: Talk with Urak Lawoi elders

Day 12 - Friday

AM: Paddle to Talo Puya – Ocean Travel Log FRN
PM: Camp at Talo Puya

Day 13 - Saturday

AM: Paddle from Talo Puya to Hat Sai Khao – Ocean Travel Log FRN
PM: Hat Sai Khao – Transect Survey, Zonation Survey & Community Study FRN

Day 14 - Sunday

AM: Paddle from Hat Sai Khao to Talo Palien – Ocean Travel Log FRN
PM: Trash Beach – Transect Survey FRN

Day 15 - Monday

AM: Talo Palien – Biodiversity Study, Community Survey & Transect Survey FRN
PM: Independent Study

Day 16 - Tuesday

AM: Koh Yang & Jabang Channel – Community Study & Biodiversity Study FRN; and Hat Jalakay: Zonation Survey & Biodiversity Survey FRN
PM: Independent Study

Day 17 - Wednesday

AM: Paddle to Adang National Park – Ocean Travel Log FRN
PM: Talk with Adang National Park scientist

Day 18 - Thursday

AM: Adang National Park scientist (continued)
PM: Paddle from Adang National Park to Koh Lipe – Ocean Travel Log FRN; clean & store gear/kayaks; meet with Urak Lawoi youth

Day 19 - Friday

AM: Travel from Lipe back to Chiang Mai
ESSAY #2 DUE @ 5 PM

Day 20 - Saturday

AM: Final Exam
PM: IFRP Presentation & Clean and return gear
FIELD RESEARCH NOTEBOOK DUE @ 5 PM
IFRP PRESENTATION SLIDES DUE @ 11:59 PM

Field Study Topics

The following topics and studies are an important part of the course. Depending on the conditions as well as availability of local partners (communities, national park staff, etc.) we may not be able to do all of these studies, but will do as many as is possible in the time allotted.

For the field studies, you will be using both your Field Research Notebook as well as your own field notes to record what you learn, questions to follow up on, and materials for your Independent Field Research Project (IFRP).

- Community resource management of both marine and non-marine resources
- National parks and state resource management
- Community life, including cultural practices, religion, organization, and management
- Fishing, both commercial and small scale artisanal
- Marine environment
- Sea grass ecology and conservation
- Mangrove ecology and conservation
- Reef ecology and conservation
- Coastal ecology
- Fisheries management, both state management and local conservation and management

Field Research

Field research is an important component of this course, and mastery of the field research methods will help make the course a success. Each student will record detailed field observations and studies in their Field Research Notebook (FRN) as a critical part of the learning on this course. Some key methodologies and techniques are described below. Specific days and assignments for the field research will be assigned. The questions and format in the Field Research Notebook will be more extensive and detailed.

Coastal/Marine Plant and Animal Identification

During the time in the coastal and marine ecosystems of southern Thailand, we will encounter an amazing amount of biodiversity. By collecting detailed information on at least 20 unique species, you will acquire a more focused understanding of how a few species fit into the diverse ecologies of these areas. During field activities, whether snorkeling, surveying seagrasses, or scrambling through a mangrove, take the time to carefully observe the organisms around you. Combine your first-hand observations with available field guides, readings, and conversations with local people.

Complete 20 entries to the greatest degree possible. You must record the English language common name (if any), the scientific name, as well as the Thai language name, and observe each species you identify in the field. 20 total described species must include:

- 3 well described plant/algae species (minimum)
- 3 well described invertebrate species (minimum)
- 3 well described vertebrate species (minimum)
- 11 additional well described organisms of any category

Ecological Field Surveys

During this course you will be using ecological field survey methods in three major ecosystems: mangroves (including mudflats), sea grasses, and coral reefs. Due to the experiential and field-based nature of this course, the types and locations of the surveys will depend in part on the wind, waves, and access to the specific ecosystems. Some surveys will be conducted in multiple locations to allow for comparison and a deeper understanding of the ecological processes at work.

- Biodiversity survey: The purpose of the biodiversity survey is to learn about all of the diversity of life (vertebrates, invertebrates, etc.) in a specific area. The goal is to understand the number of different species in the designated area.
- Community study: The purpose of a community study is to look in-depth at a specific area and note the species diversity as well as map the species within a bounded area, identifying and counting the number of different species as well as the number of individuals of each.

- Transect survey: A transect is a survey along a line in a designated area, to understand diversity, abundance, and distribution along the transect line. Tally all organisms within one meter of both sides of the transect line, and record the substrate directly below the line.
- Zonation survey: The zonation survey is a transect along a gradient (e.g. salinity or water depth) to understand how species and diversity vary along the gradient in question.

Mangrove Channel Study

Through this study you will gain first hand insight into the ways abiotic and biotic conditions vary within mangrove ecosystems by comparing how abiotic and biotic factors change with distance from the coastline. Observations will be compared between sites to obtain a general impression of how conditions and communities can vary within mangroves depending on location and microenvironment.

Study Locations

- Mouth: The opening of the mangrove to the ocean
- Mid-Channel: Where the channel is 8-10 meters across
- Narrow Channel: Where the channel is less than 4 meters across

Directions: Snorkel in the channel and near the roots of the mangroves, looking carefully for juvenile fish and invertebrates. Visibility may be poor, but observe as much as you can. Use dive slates to collect observations.

Questions

- 6. What is the substrate (bottom) like? Describe.
- 7. Describe if there is leaf litter present. Are there signs of herbivory or observable decomposition? Can you observe what is eating the leaf litter?
- 8. Do you see any invertebrates? What species / size / location?
- 9. Do you see any fish or other vertebrates? What species / size / location?
- 10. Using the field guides, identify and list the predominant tree species at this location.
- 11. How dense is the tree canopy cover in this location? Does much light reach the water?
- 12. How does this compare to the other two locations?

Synthesis: Identify and write down one difference between the 3 zones and hypothesize a source of this difference. How does this shape the ecosystem? Sketch the three zones and annotate to highlight differences between them.

Marine Life Discussion with Community

This activity is designed to help you learn more about how local people use the local environment to help fulfill their needs, including how their relationship to the surrounding environment has or has not changed over time. Prepare questions to learn about the following issues, and record answers in your field journals:

- 13. What do community members collect from the marine environment, and from where? Mangroves, sea grass, reef, deeper water?
- 14. What tools do they use to catch/collect from these environments?
- 15. What time of day? What season / time of year?
- 16. How have things changed over time? What is it like now? What was it like when they were young?
- 17. Have the size and diversity of fish, for example, changed compared to now and when they were young?
- 18. For each thing collected, is this for family/personal use, or is it sold?
- 19. Who in the family does this? Is it everyone, mostly men, mostly women, depends on who is available?
- 20. Does the community manage access to these resources? If so, how? Are there any rules or traditions around collecting/catching in the marine or coastal environment?

Course Policies

Attendance Policy

Students are expected to be on time and attend all classes. If you are ill or otherwise need to miss a class, please inform your instructor or teaching assistant.

Academic Integrity

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in ISDSI courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own can result in disciplinary action.

Scholastic Dishonesty

Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering forging, or misusing an academic record; or fabricating or falsifying data, research procedures, or data analysis. Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.

Grading Standards

Letter grade	Score or percentage	Description
A	93–100	Achievement that is outstanding relative to the level necessary to meet course requirements.
A-	90–92	Achievement that is significantly above the level necessary to meet course requirements.
B+	87–89	Achievement that is significantly above the level necessary to meet course requirements.
B	83–86	Achievement that is significantly above the level necessary to meet course requirements.
B-	80–82	Achievement that meets the course requirements in every respect.
C+	77–79	Achievement that meets the course requirements in every respect.
C	73–76	Achievement that meets the course requirements in every respect.
C-	70-72	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
D+	67-69	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
D	60-66	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
F	0-59	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an Incomplete.