



THE SCHOOL
FOR FIELD STUDIES

Eastern Himalayan Forests and Biodiversity

SFS 3580

Syllabus

The School for Field Studies (SFS)
Center for Climate and Sustainable Futures
Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER, Bumthang)
and Bhutan Ecological Society
Paro, Bhutan

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise.
Course content may vary from semester to semester.

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COURSE CONTENT SUBJECT TO CHANGE

Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

- Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;
- Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;
- Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that they may present. In other words, the elephants are not always where we want them to be, so flexibility is key.

Course Overview

The eastern Himalayan region is characterized by extensive and numerous mountains and valleys, hosting the world's highest peaks and a diversity of vegetation and wildlife. Identified as one of the world's ten biodiversity hot spots, the Kingdom of Bhutan is home to an estimated 770 species of birds and other diverse fauna, including the takin, snow leopard, golden langur, blue sheep, and tiger. Varied ecosystems are also found in the country, ranging from subtropical broadleaf forests in the south, to subalpine conifer forests, alpine shrub, and high-mountain meadows. The highest elevations comprise rock and ice. Located in the subtropics, Bhutan's climate is dominated by summer monsoons which bring the majority of precipitation for the year. The country also has more than 70% forest cover and about 50% of Bhutan is under formal conservation protection.

Bhutan is internationally famous for its development concept of Gross National Happiness (GNH). GNH is the guiding principle of development in Bhutan and is understood to have four pillars: good governance, cultural protection and preservation, sustainable development, and environmental conservation. Across the country, people have developed and maintained rich cultural traditions and social and political institutions that reflect the Buddhist principle of 'The Middle Path', integrating people and nature as well as traditional knowledge and modern science. Sustainable management of natural resources, including soil, water, biodiversity, and minerals, is critical for Bhutan, as these resources are fundamental to the national identity as well as the economy.

In early 2008, Bhutan's government became a democratic constitutional monarchy opening the door for devolution of authority to regional governments and communities. Since the majority of the population reside in rural areas, sustainable management of natural resources is critical for achieving the dual goals of poverty alleviation and biodiversity conservation. Defining baselines for biodiversity and ecosystem function is critical and, coupled with training in field research methodologies and communication in science, scientists and environmental authorities are increasingly effective at achieving development and conservation goals.

The SFS-Bhutan summer program is a 6-week interdisciplinary, field-based course where students study a country and region characterized by dramatic mountain landscapes and rich flora and fauna. Traveling through Bhutan, our SFS group will learn about culture and history, religious traditions, environmental issues, and conservation policies. Students will stay in Bhutanese villages and trek across Himalayan landscapes to experience and understand local environments and rural livelihoods. Academically, students will also develop skills in assessing environmental problems, defining research questions, conducting field research, and communicating results. Students will learn camera trapping, forest measurement and landscape reading skills. Moreover, SFS students will come to appreciate the complexity of identifying and addressing conservation and development issues in a rapidly changing region.

SFS partners with the Ugyen Wangchuck Institute for Conservation and Environment Research (UWICER), an international research and training facility in Bumthang, Bhutan and the Bhutan Ecological Society (BES), a Civil Society Organization promoting environmental sustainability in Bhutan. SFS students and faculty will collaborate with UWICER and BES to advance their research agenda in several priority areas, including forest management, community resource assessment, and development policy.

Learning Objectives

There are multiple topical themes in this course: culture and religion of Bhutan; conservation and development policy; forest and resource management; local knowledge systems; and changing rural livelihoods. These will be addressed through classroom lectures and discussions, field lectures, and field research, including Field Exercises (FEX) and a Field Project (FP). Classroom and field lecture topics will include essential background information, and field exercises will be used to reinforce key concepts and provide students with field-based experiences. Extended field trips will enable students to examine ecological and cultural elements across the landscape and cultivate a deeper understanding of the social, religious, political and environmental characteristics of Bhutan.

Following this course, students should:

1. Be familiar with the unique cultural, political, economic, and environmental aspects of Bhutan.
2. Understand basic concepts of rural development, community resource management, forest-based livelihoods and environmental sustainability as well as the practical application of those concepts. They will become aware of the important (and often underestimated) societal factors that affect development and conservation.
3. Be able to recognize several vegetation types according to elevation, and to identify threats to ecosystems and conservation strategies to maintain them.
4. Have implemented a field research project, conducted field data collection, managed and interpreted data sets, and communicated research results to diverse audiences and constituents in Bhutan.

Assessment

Several field exercises and a field project, which entails field-based data collection and analysis, will provide students with experience in scientific research. Some assignments encourage students to work together, to share ideas and knowledge. This allows students to take advantage of the range of backgrounds within the group. Unless the assignment indicates that only one copy of the answers is required from the group, students are expected to complete their own assignments. The final course grade will be based on the following assessment items.

Assessment Item	Date due	Value (%)
Active Participation and Field Notes	Throughout	10
Field Exercise 1 – Reading the Landscape	11 pm, TBC	10
Field Exercise 2 – Resource Based Livelihoods	11 pm, TBC	10
Field Exercise 3 – Physical Science Methods I (Camera Trapping)	11 pm, TBC	10
Field Exercise 4 – Physical Science Methods II (Forest Inventory)	11 pm, TBC	15
Final Exam	TBC (10am – 12 noon)	15
Draft Research Proposal (FP team)	5pm, TBC	5
Final Research Proposal (FP team)	5pm, TBC	5
Final Research Paper (FP team)	2pm, TBC	15
Research Presentation classroom symposium (FP team)	10am – 12pm, TBC	5

Active participation

During this program, we will travel through many eco-regions and rural communities. We expect that you will be an *active observer*, constantly observing the landscape, livelihoods, and culture and *participating in discussions* regarding these observations. Active participation includes constructive engagement with the full range of course activities, respectful awareness of our cultural context, and responsible behavior as a group member who is involved in others' learning.

Field notebook and assignments

You will develop a comprehensive *program field notebook* that documents and captures your on-the-ground learning experiences and serves as your primary record of content and reflections during the course. This notebook should accompany you at all times: in the classroom, guest lectures, and the field. All class notes, field notes, data from field exercises, reflective comments and questions on course material, notes from discussions, and short written assignments should be contained in this notebook, and you will be graded on the thoroughness of this work as part of active participation assessment. You must develop a Table of Contents with numbered pages so you can easily locate material for the exam and to reference in your research. You may want to develop sections for observations during travel, translations or words in Dzongkha, notes to remember for your field project, cultural notes, and reflective writing on how this experience is reshaping your understanding of people and the environment. Keep this separate from personal journaling you may do. Additional course handouts should be kept in the folder provided.

When using citable material from your field notebook in written reports, use the following format to acknowledge the source: (*Tenzin Student*, Field notes, *Jakar*, 12 June 2019). Whenever possible, use the name of the person providing the information; if not possible, cite descriptively, for example: "Firewood gatherer in Paro forest."

Field Exercises

FEX 1. Reading the landscape

Guided by faculty, students will learn how to observe different elements of the landscape and understand larger cultural and religious concepts associated with the treatment of different landscapes. They will observe and document multiple landscapes during their stay in Bhutan. Reflecting on the broader theme of the course, students will individually record ecological and cultural aspects of the landscapes they traverse.

FEX 2. Resource-based livelihoods

We will geolocate ourselves, explore the local area, note development indicators and examine changes in the landscape and livelihood strategies based on proximity to town. In small groups, students will survey routes and create a rough map of land use and livelihood strategies and note the ways that these change in relation to proximity to Paro. Students will learn basic mapping skills and alternative ways to approach mapping as a geographical tool. Students will ask: "what are some of the roles played by mapping in conservation and development initiatives?"

FEX 3. Physical science research methods I (Camera Trapping)

Camera traps are one of the most efficient methods of surveying animals in forested landscapes. Data collected from camera traps are being increasingly used for conservation and management purposes. Students will learn how to operate and set up camera traps, retrieve data from previously set up traps, and analyze the data to estimate diversity and density of animals.

FEX 4. Physical science research methods II (Forest Resource Assessment)

Students will work in groups to conduct a forest inventory. Student groups will collect data on forest species composition and stand parameters such as height and DBH of trees. Measurements will be used to estimate forest growing stock, stand characteristics and biodiversity parameters.

Final Exam

Students will write one synthesizing exam that integrates the main course themes.

Field Project

Student teams will design and conduct a field research project led by the instructors. The team will write and revise a proposal, conduct research, and produce a paper based on their findings. This paper should follow the general framework of a scientific report and will give students experience in concise organization and presentation of data. Each group will conduct two oral presentations of their research: in class and to an audience of stakeholders and government officials in Paro.

Student teams will work with a faculty mentor throughout the program to refine research questions, design the study, carry out the fieldwork, analyze the data, and write and prepare report and oral presentations. Specific guidelines will be provided when the projects are introduced.

Grading Scheme

A	95.00 – 100.00%	B+	86.00 – 89.99%	C+	76.00 – 79.99%	D	60.00 – 69.99%
A-	90.00 – 94.99%	B	83.00 – 85.99%	C	73.00 – 75.99%	F	0.00 - 59.99%
		B-	80.00 – 82.99%	C-	70.00 – 72.99%		

General Reminders

Plagiarism, using the ideas and material of others without giving due credit, and cheating will not be tolerated. A grade of zero on the assignment will be given for plagiarism or cheating or aiding another person to cheat either actively or passively. Plagiarism cases may be reported to the student's home institution and may be grounds for further academic disciplinary action.

Deadlines for assignments are established to promote equity among students, to allow faculty enough time to review and return comments and grade before other assignments are due; and to avoid clashes with other activities and courses. Therefore, deadlines are firm and extensions will only be considered under extreme circumstances. Unapproved late assignments incur 10% penalty per day and assignments will not be accepted after three days.

Course Content, Lectures

Type – **L**: lecture and discussion; **GL**: guest lecture; **FL**: field lecture; **FEX**: field exercise;
D: discussion; **SLD**: Student Led Discussion; **FP**: Field Project

Instructors – **PBC**: Purna B.Chhetri **KW**: Kuenga Wangmo **TT**: Tshering Tempa **SP**: Sonam Phuntsho **NN**:
 Nawang Norbu

Readings in **bold** are required; others are optional supplementary reading.

Note: Syllabus items and course content are subject to change,

No	Type	Date	Class title	Hrs	Lead	Reading
1	L, D	TBC	Academic orientation including FP	1	All Faculty	Syllabus
2	L	TBC	Introduction to Bhutanese Culture	1	SP	
3	L, D	TBC	Biogeography of the Himalayas	1	PBC	Singh & Singh 1987 (pages 84-87)
4	L	TBC	Introduction to Bhutanese Language	1	SP	
5	L, D	TBC	Bhutan – The Last Himalayan Biodiversity Refugia	1	NN	
6	L, D	TBC	Conservation and Buddhist Culture	1	KW	Kuyakanon 2014 Pommaret 2004
7	L, D	TBC	Introduction to Buddhism	1	NN	
8	FL	TBC	A Country in Transition: Journey through textiles	1	KW & PBC	Visit: Textile Museum
9	FEX 1	TBC	Natural and Cultural Landscapes I & II (Pangrizampa & Tango)	6	KW & PBC	Allison 2015 Skog 2016 Diaz 2015
10	L, D	TBC	Natural Resource Management Systems in the Bhutan Himalayas	1	PBC	Wangdi 2018 Dorji 2006 Wangdi et al. 2014
11	L, D	TBC	Conservation and Development (Tourism & Eco-tourism)	1	KW	Peet & Hartwick 2009 (Ch1) Penjore 2007
12	L, D	TBC	Human Wildlife Conflict and Rural Livelihoods	1	TT	Siebert & Belsky 2014
13	L	TBC	Lifezone Ecology of Bhutan Himalaya (Flora & Fauna Identification FL)	1	PBC	Wangda & Ohsawa 2006
14	FEX 2	TBC	Resource Based Livelihood and Development Indicators in Paro	6	PBC & KW	FEX Handout Plieninger <i>et al</i> 2015

No	Type	Date	Class title	Hrs	Lead	Reading
15	L	TBC	Quantitative Data Management and Presentation	1	TT	Bhattacharjee 2012 (p113-129)
16	FP	TBC	Introduction to Field Projects (FP) Topics	1	All Faculty	
17	L	TBC	Ecosystem Services of Himalayan Forests & Biodiversity	1	PBC	Kubiszewski et al 2013 Costanza 1997 Schroeder 2014
18	L & FEX 3	TBC	Physical science research methods I (Camera Trapping)	6	TT	FEX Handout
19	L	TBC	GNH & the Middle Path	1	KW	Mancall 2004 RGOB 1998 Ura 2011
20	FL	TBC	Plant ID	1	PBC	
21	FL	TBC	Forest Produce Trade at Local Markets	2	KW, PBC & TT	
22	FL	TBC	Agroecology: Interactive Learning with Farmers	2	PBC & TT	
23	FL	TBC	Dry Valley Agriculture (Agriculture Research & Development Centre, Bajo)	1	GL	
24	FEX 4	TBC	Forest Resource Assessment	3	PBC & TT	FEX Handout
25	FL	TBC	Assess Avi-faunal Diversity along an Inter-valley Mountain System	3	PBC & TT	
26	GL	TBC	Community Forests & Rural Incomes	1	SP	Moktan 2015 Phuntsho 2011
27	GL	TBC	Big Cats and Bhutanese Forests	1	TT	Tempa et al. 2013
28	L, D	TBC	Lost Land of Tigers: Discourse on Wildlife Documentary	1	TT & KW	
29	GL	TBC	Forests in A Changing World	1	TBC	
30	L	TBC	People and Forests: Changing Socio-economic Dimensions	1	KW	Wangchuk & Wangdi 2015 Rinzin & Glasbergen 2007
31	SLD	TBC	Can Forests be a Major Driver of Economic Growth for Bhutan?	1	PBC & KW	Jadin et al 2015 Persha et al 2010 www.bliss.bt

No	Type	Date	Class title	Hrs	Lead	Reading
32	L, D		Multi-scalar Environmental Governance	1	NN	Agarwal <i>et al</i> 2008
33	L		Exam Review – Q & A	1	All Faculty	
34			Final Exam	2		
			Classes Total	56		
			FIELD PROJECTS			
	FP		Field Projects: Field Data Collection	24	FP team	FP topical readings provided
	FP		Field Projects: Analysis & Write-up	10	FP team	
	FP		FP Symposium	5	FP team	
35			Wrap-up: Making Sense of it All	1	All Faculty	
			FP Total	40		
			TOTAL CONTACT HOURS	96		

Readings

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