



**ENVIRONMENT AND CULTURE:  
THE HIMALAYAN ECOSYSTEMS PROJECT  
FALL 2016  
SEPTEMBER 22 – NOVEMBER 4**

**ACADEMIC SYLLABUS**

**Lead Instructor:** Chris Carpenter, Ph.D.

**Contact Hours:** We will all be in close contact, meeting every day throughout the course. There will be a number of “check-in days” where we will schedule student-faculty meetings. If you would like to have a meeting outside of those times, you can certainly make an appointment or find an appropriate available time, and we are happy to oblige.

**Class Meetings:** This Wildlands Studies Project includes seven days a week of instruction and field research throughout, with a little bit of free time on most days. Faculty and staff work directly with students 6-10+ hours a day and are available for tutorials and coursework discussion before and after scheduled activities. Typically, scheduled activities each day begin at 7:00 am and finish at dusk, with breaks for meals. Class presentations are usually scheduled for the late afternoon, and we try to keep the evenings free. When we are in the backcountry or at a field site, our activities may start as early as 6 am or end as late as 10 pm (e.g., for wildlife observation). It is necessary to be flexible and able to accommodate a range of class schedules.

**Course Credit:** Students enrolled in Wildlands Studies Projects receive credit for three undergraduate courses. These three courses have distinct objectives and descriptions, and we integrate teaching and learning through both formal learning situations (i.e., lectures and seminars) and field surveys. Academic credit is provided by Western Washington University. Extended descriptions follow in the course description section of this syllabus.

1. **ESCI 497T, Environmental Wildlands Studies (5 quarter credits)** – Field study of environmental problems affecting the natural and human-impacted ecosystems of our study region, including the role of human interactions.
2. **ESCI 497U, Environmental Field Survey (5 quarter credits)** – In this field-based course we conduct on-site examinations and analyses of environmental problems affecting wildlands and wildlife in our study region.
3. **ESCI 497V, Wildlands Environment and Culture (5 quarter credits)** – Field studies course involving on-site research in our field location, studying the relationships among cultural groups and the environment. Using region- and culture-specific case studies, students assess historical and current cultural and environmental uses of wildland and/or wildlife communities. Course examines outcomes of environmental policies and wildland/wildlife management, including both sociological and natural consequences.

**Readings:** A Course Reader has been developed for this project and will be provided to students through a Dropbox account. Students should print and bind the Reader in advance of joining the project in India, or render it suitable for viewing in pdf format on a device that has a long battery life. Readings include selections from academic primary literature, technical reports, book chapters, and environmental impact assessments and planning documents. While in the field, we will carry a small reference library of useful texts and articles.

## Contents of this syllabus:

- I. Project Overview & Outline
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### I. Project Overview

The Wildlands Studies program in the Indian Himalaya follows a field study format and takes place mainly in roadless backcountry regions of Kumaon, in the Indian state of Uttarakhand. Kumaon includes high mountains on the Himalayan frontier with Tibet, extensive areas of oak-pine forest in the adjoining foothills, and subtropical monsoon forest on the plains to the south. The ecological amplitude present in this area, an unbroken transect from near tropical climate to ice-bound mountains, offers the potential for fascinating and informative ecological field studies. The project area in Kumaon is populated by two main ethnic groups: Paharis and Rung. The former are descended from plains dwellers that came into the hills many centuries ago to engage in upland farming. The Rung are trans-Himalayan traders and livestock-herders with a transhumant lifestyle and cultural heritage that traces back to India and Tibet.

The natural vegetation in Kumaon is distinctive and provides an excellent opportunity to learn about plant adaptations to mountain environments, and how plant communities change on an elevation gradient. Furthermore, numerous invasive species have become ecologically significant in this region, especially at the lower elevations where human impacts are more pronounced. Wild mammals are abundant in the mountains of Kumaon, but may be difficult to see in the steep and thickly vegetated landscape. Even so, we will attempt to gather information about their habits and distribution by looking for signs. Finally, a group like ours, with mobility and time in the field, can provide useful information to local authorities about habitat conditions and abundance of resources upon which focal wildlife species depend.

Human ecology is very important to understanding the Himalayan region and learning how local stakeholders regard environmental management and stewardship. Bearing this in mind, we will plan to meet villagers and other resource people whose subsistence lifestyles range from settled, terraced agriculture at the lower elevations to pastoralism in high inner valleys. With increasing labor migration, a rapidly changing local economy, and development agendas from the Indian public and private sector, and Kumaonis themselves, lifestyles in the area are undergoing rapid transformation. Increasing literacy rates, access to health care, development of roads and training institutions, government subsidies, and access to new financial services are all changing the palate from which local people can make their life choices. Some of the anthropological generalizations that may have been apt in previous decades no longer hold true in the Kumaon region. All these factors hold academic significance because they influence the stakeholders' use or stewardship of the land. As an area that remains abundant in both wildlife and agriculture, it is important to discuss the possible consequences of these changes.

We are a mobile group, traveling on foot through the backcountry, spending extended periods in those places most significant to our field studies. After a week of orientation and field study in the foothills, we will travel by jeep to our trailhead, in proximity to the higher mountain ranges. En route, we will visit seasonal villages where local people will be harvesting their summer crops of hemp and buckwheat, and preparing their animals for the fall journey to low elevation.

Midway through the program, the group will take a break from trekking and backcountry activities, camping near a town. We will schedule the midterm for this period, and everyone will have a day to wash, relax and recharge their batteries. Then we'll begin the second part of the program, traversing an area of middle mountains with vegetation and land use patterns that are very different from those of the High Himalaya.

Throughout the program, periods of structured field studies are interspersed with days during which we travel on foot from one field location to another. Wildlife of concern may include birds, mammals, insects, and plants and other kinds of organisms as well. We will have with us a compact but well-stocked portable library of documents about the Himalayan region, and one tent big enough to hold the whole group when we want to have class and it's cold or raining outside.

Days begin early, with fieldwork or trekking if we need to relocate to a new field site. Some days are physically demanding, but we try to pace the activities so that there is enough time to see and learn as much as possible. In the course of a day, we may meet with local people, observe wildlife, or follow up on the types of interesting and unexpected field observations that are frequent in the Himalayan backcountry. Late in the day, we will recap and review our progress, and there will be a presentation or group discussion on Himalayan ecology. There will be regular assigned readings, and each student will be responsible for giving one presentation to the group on a topic of interest to them, related to Himalayan ecology or culture.

The logistics of fieldwork in roadless backcountry – foot travel only – are assisted by a skillful, experienced team of guides, most of whom were born and raised in the hill country of Kumaon. Hiring local people provides us with a team of cultural experts and provides much-needed wages to the local community. Mountain people from Kumaon have a great deal of cultural pride and a deep knowledge of the local environment, and display nearly unlimited patience and an awesome level of commitment to our safety and well-being. Traveling as a multi-cultural group adds an invaluable dimension to the course. Although we are deep in the mountains, the Wildlands Studies Himalayas Project emphasizes a rigorous academic schedule, and productive field studies.

## **II. Learning Objectives**

Classroom learning can give the impression that different areas of knowledge are isolated from one another. In the field, the boundaries that separate 'subjects' like wildlife, climate, earth science, conservation, and cultural ecology tend to melt away. With some guidance, these topics will be integrated in a way that allows the students to learn through an eco-systemic approach, which enables the student to understand biological phenomena and its cultural implications.

Today Kumaon, like other Himalayan regions, is in a state of transition. Trans-Himalayan trade was severely curtailed a half-century ago when conflict between India and China closed the border with Tibet. In 2000, the Kumaoni people acquired statehood within India (as part of the new state of Uttarakhand), and have developed a reputation for effective social action to protect the environment and promote their own development agenda. Road construction in this area has led to a transition from local subsistence agriculture to cash cropping, and there is increased tourism development to support demand for recreational activities within India. These are not new changes to Kumaon, but the scale on which they unfold in this area gives us the opportunity to view as a case study many of the issues that are playing out all over the developing world. A few years ago, Uttarakhand attracted media attention from devastating floods. The area is still rebuilding bridges, roads and trails. This has academic meaning as well as emotional significance to us because the causes of such natural disasters are often linked to human development and environmental planning, providing us an opportunity to delve deeper into how the national agenda for growth affects the local ecosystem and population.

In Kumaon, lifestyles of the mountain people are ecologically, economically, and culturally informative. How might a family keep the monkeys out of its cornfield, or get water to a patch of good land that happens to be at the very top of a hill? When does it make sense to use dung for fertilizer, when to burn it as cooking fuel? How does a community decide which forest resources to exploit and which to conserve, and how much each family may take for itself? How does a household find funding to meet their needs during lean times? How can a local engage in agriculture if they don't have access to land? What does one do with crop surplus when the nearest market is several days' walk on a twisty mountain trail? Why have so many kids? What are the best ways for farmers to manage agricultural risk when crop failure can mean displacement or famine? What push or pull factors drive migration? Is it appropriate to send the kids to school when an education almost certainly means they will leave their parents' homeland to look for more lucrative employment in a distant city?

Following this project, students will have working knowledge of and experience in:

1. **Ecology of Mountain Environments.** We will focus our field studies in this section on how the physical environment controls patterns of species richness and endemism, and how organisms (and communities of organisms) specialize to the extreme conditions characteristic of high elevations in the Himalayan region. A big elevation gradient in this region means many different environments, which makes our class especially valuable for studying adaptation.
2. **Ecology of wild vertebrates (mammals and birds) in the Kumaon region.** Kumaon is rich in both mammal and bird species, with a relatively high abundance of raptors including Himalayan Griffons and the threatened Lammergeyer, one of the world's largest bird of prey. Mammal species we may be fortunate to see include Serow, Himalayan Tahr, Marten, and Hanuman Langur (a wild monkey). Students will keep track of the different species observed, make behavioral observation and identify habitat features that determine their presence.
3. **Community-based conservation.** India promotes the idea that natural resources and ecologically-based tourism may be managed best by local stakeholders. We will learn important principles that underlie effective community-based conservation and integrated conservation development. Community-controlled tourism is another conservation method that is currently being implemented in some of our field sites, and one that our local staff is very familiar with. In Kumaon, we will gain critical insights into how effectively these ideas are being put into practice.
4. **Geography of the Himalaya.** Processes of mountain building (orogenesis) and erosion are expressed vividly in the dynamic Himalayan landscape. Students will learn how tectonic activity and the powerful South Asian monsoon feed back on one another to control landscape evolution in the Himalayan region.
5. **Human ecology and cross-cultural studies.** Pahari culture in the mountain valleys of Kumaon is distinct from other regions of the Himalaya. Kumaon is well known for a long history of social and environmental activism, as reflected in the Chipko movement, and local farmers display a profound depth of knowledge about the environment in which they live. Traditional systems of agriculture are highly evolved and need to be locally diverse since the absence of roads demands that villages be as self-sufficient as possible. Immersed in the culture, working alongside local residents, our students will gain significant appreciation for, and a basic understanding of, the mountain peoples of the Indian Himalaya.
6. **Rural livelihoods, poverty and development.** Subsistence agriculture is important in the Kumaon region, but ongoing road construction in some areas now enables cash crop agriculture and a range of economic alternatives. Most families engage in a range of activities, each with various economic and environmental outcomes. Our experience over nearly a decade in this region will provide students with a unique insight into these trends. We'll examine the changing nature of the region's demographic profile, exploring key development issues and trends.
7. **Diversity estimation methods.** Students will practice different field survey methods to collect and analyze data on the composition of species of the different Himalayan habitat that we will visit. The techniques that students will learn are tools that they can bring back to their home countries and apply in their chosen study areas.
8. **Field identification of flowering plants.** We will use field guides and local expertise to identify plant species that occur at various elevations in our study area. We'll give special attention to those woody plant species (trees, shrubs and bamboos) that occur in middle elevation forests (about 7500 – 11,000 feet).

These topics will be addressed through structured presentations and discussion, course readings, field activities, interactions with local people, exposure to ongoing research, extended backcountry excursions, and field research projects. The course generally starts with field techniques that will provide students with the foundation they will need for field studies throughout the project. Field activities will be interspersed with lectures and assigned readings, structured to take the best advantage of our locations. Cultural topics will be taught initially through faculty-led instruction and evolve into a student-led critical evaluation, analysis, and synthesis in the end of the course. Our overarching goal is to have students leave the course with extensive knowledge about this particular region, and

broader skills and understanding of ecological, geological, and social sciences that allow them to critically evaluate information in other settings in their future lives and careers.

### III. Course Descriptions

We teach these three courses in an integrated format in the field. However, students will receive transcript credit for the following three courses, which were introduced on page 1:

**ESCI 497T, Environmental Wildlands Studies (5 quarter credits)** – Field study of environmental problems affecting the natural and human-impacted ecosystems of our study region, including the role of human interactions.

*Experience/Activities:* This course will teach students about the physical and biological environments of the Indian Himalaya, using the Kumaon region of Uttarakhand, India as a field site. We will focus on the biological ecology of this area with special emphasis on how ecosystems change with elevation. These changes are functional (morphology and phenology of dominant plant groups, relative importance of invasive species), taxonomic (biogeographical affinities of the dominant groups), and they are expressed at the community level as well as with measurable changes in species density along the elevation gradient for many apparent groups such as birds and vascular plants. We will also consider physical geography in terms of landscape evolution in a tectonically active (rapidly exhuming, rapidly eroding) mountain region, and discuss some of the fascinating new insights regarding the interplay between orogenesis (mountain building) and atmospheric processes. Mountain climates and the critical role of the South Asian Monsoon is another important subject we will consider. Sometimes landscapes in the Himalaya change catastrophically with glacial lake outburst floods and massive landslides.

*Outcomes:* Students will learn how the composition of an ecological community and the characteristics of its component species relate to environmental variables that change with elevation. Students will learn to recognize typical mountain habitats in the Central Himalayan region, including subtropical, temperate, and subalpine forests; alpine rangelands, and periglacial habitats, and understand how these differ ecologically from their counterparts in the mountain regions of Europe and North America. Students will be instructed in methods of field observation, and how to recognize important taxonomic groups in this diverse part of the world. We will also consider the natural history and ecological impact of invasive plants. At higher elevations, we will evaluate how severe climate and distinctive mountain processes like landslides and stream erosion affect the ecosystem. The Himalaya are also an ideal place to learn about dynamic processes of mountain building through plate tectonic activity because these processes are very much at work in the Himalaya today. Instructors will teach the students through structured presentations, and students will also learn much through direct observation and informal discussion with course instructors.

*Evaluation/Assessment:* Students will receive two examinations and two short quizzes, and each student is expected to give an oral presentation to the group. Success will require consistent attendance and motivated participation in class activities. Students are expected to demonstrate knowledge of ecosystems, natural history, and important species and natural processes. Students will also work together to keep a species list for selected plant and animal taxa encountered in the different elevation zones we will visit on this program.

Examinations and quizzes – 70%, Oral Presentation – 30%.

*Textbooks:* Course reader, species identification manuals and taxonomic keys, reference books and articles in the class library.

**ESCI 497U, Environmental Field Survey (5 quarter credits)** – In this field-based course we conduct on-site examinations and analyses of environmental problems affecting wildlands and wildlife in our study region.

*Experience/Activities:* Students enrolled in the Wildlands Studies program in the Himalaya have, with their instructors' help, been collecting information about the forests of this region for several years. This represents a significant data set that has led to several peer reviewed publications, and which has been of value to understanding the ecosystem processes at work in this mountain region. This fall, we focus these efforts on an assessment of forest habitat at middle

and subalpine elevations. Students will contribute to this effort by monitoring the forest ecosystem, identifying and measuring tree species, and estimating plant species richness and habitat quality in forest plots located at various elevations. These forest plots will be located by means of GPS, and photographs will be taken for future comparisons. We know from experience that this project is demanding, but interesting for students, and suitable for those who are still learning the fundamentals of forest ecology. It also provides students with the opportunity to look much more closely at the forest ecosystem than they might otherwise.

Outcomes: Students will conduct structured fieldwork including data collection and analysis as described above. This will require participation in instructional presentations, a mastery of equipment and techniques commonly employed by ecologists working in the field, and an overall understanding of the relevance of the task. Students will work together in teams to complete this part of the course, but each student will have specific responsibilities. Students will become acquainted with the tree flora of the Eastern Himalaya so that they can identify common taxa at the genus level. Since these taxonomic groups occur in mountains worldwide, and since plant identification skills are globally applicable, the skills learned when we study Himalayan forests will make the students better field biologists – wherever they work in the future. Students will also improve their ability to infer mammal distribution and behavior from indirect evidence such as footprints and scat.

More generally, students will obtain a practical understanding of ecosystem processes and how they are affected by the many disturbances that occur in the Himalaya, both ‘natural’ and anthropogenic. These practical insights will be used as a platform to facilitate discussion about future trends in wildlife conservation, especially how ongoing changes in air temperature or the intensity and timing of monsoon rainfall are likely to affect the mountain ecosystem.

Evaluation/Assessment: Students will receive two examinations and two short quizzes. Success will require consistent attendance and motivated participation in class activities. Students are expected to learn and to apply their knowledge of ecosystems, natural history, and important species and natural processes to data collection efforts in the field. These efforts include surveys of plant diversity and observation of wild mammal signs. Students will be responsible for keeping an accurate record of selected plant and animal taxa they encounter within the project area.

Examinations and quizzes – 40%, participation in field assessment – 40%, participation in analysis of results – 20%.

Textbooks: Course reader, technical literature, field identification keys (published and those prepared by course instructors), articles and working papers prepared by course instructors.

**ESCI 497V, Wildlands Environment and Culture (5 quarter credits)** – Field studies course involving on-site research in our field location, studying the relationships among cultural groups and the environment. Using region- and culture-specific case studies, students assess historical and current cultural and environmental uses of wildland and/or wildlife communities. Course examines outcomes of environmental policies and wildland/wildlife management, including both sociological and natural consequences.

Experience/Activities: This course will consider the human component of the Kumaon Himalaya, as manifested through traditional cultural institutions, environmental management practices, and anthropogenic impacts on the ecosystem. Students will work and travel together with members of two main indigenous culture groups, and learn much about their traditional ways and how they are transitioning into a more modern, globalized society. These people include the transhumant Rung people of the Darma and Johor Valleys, who inhabit the higher elevations closer to Tibet, and the Pahari farmers of the middle hills. Local environmental impacts are manifold. Examples include road construction and conversion of traditional agriculture to cash crops. Tourism infrastructure is also beginning to affect life in the hills in some areas. Students will have frequent opportunities to observe these phenomena, which will provide an important foundation to both structured class presentations and impromptu discussions.

We will consider global impacts and their effect on the Himalayan environment, taking note of the fact that what happens in the Himalayan region in terms of water catchment and soil erosion has the potential to directly affect the lives of more than a billion people who live on the adjacent plains. The effect of climate change on the Asian monsoon is of particular concern. Evidence shows that monsoon rainfall has become more sporadic in recent decades. The effect of

climate change on Himalayan glaciers is another significant, contentious topic that we'll have the opportunity to explore. Kumaon has a long history of community-based forestry and natural resource management, which began when the British began logging and planting tea here more than 150 years ago. The progression of forest management in this region is a fascinating case study in sustainable mountain development.

Outcomes: Students will confront the differences between how Western visitors to the Himalaya idealize vernacular culture and the reality of what it is like to practice a subsistence lifestyle on steep slopes, or to transition away from a heritage in the mountains to a new livelihood based on wage labor and urban values. Students will learn the history (and pre-history) of Himalayan cultures, how different groups originally settled their homelands, and a sense of the various skills required to endure in this landscape for generation after generation. Students will come to understand why mountain people tend to be risk-averse, and what a high degree of stamina and intelligence this lifestyle requires.

Since this class considers human ecology, structured learning for this course will include presentations by course instructors, supplemented by discussions with local experts and stakeholders in the communities that we visit. Students will gain experience interviewing local people (in translation), and learning how to frame a useful question in this context. Students will read from the peer-reviewed literature on the local impacts of anthropogenic disturbances both regional and global in scale, and evaluate contrasting positions in the debate as to whether hill slope agriculture contributes to down slope erosion (which is a big, contentious subject among scholars of Himalayan resource management). Students are required to be engaged during the discussions, to do the readings, observe the purported impacts with a critical eye and learn skills of field appraisal.

Evaluation/Assessment: Students will receive two examinations and two short quizzes. Success will require consistent attendance and motivated participation in class activities. Students are expected to interact with local people, including those on our staff as well as residents of the villages we visit, and to make critical, but non-judgmental observations of local customs and land-use practices. We will share these ideas, and students may be asked to write short essays on this subject. Students will be responsible for compiling these observations and making preliminary conclusions about management trends.

Examinations and quizzes – 40%, participation in group field project – 30%; participation in discussions and workshops that focus on the cultural component of the Kumaon region – 30%.

Textbooks: Course reader, peer-reviewed literature from the class library.

#### IV. Assessment

The following is an overview of the academic requirements for the program. Some of the assignments are ongoing (student presentation, course readings, and field studies); others have specific dates (midterm and final examinations). Due dates will be reconfirmed (or may be adjusted) once the course begins. Final grades for each course listed above will be based on the following items:

Course Number	Assessment Item	Date Due	Percent of Grade
ESCI 497T	Mid-Term Examination	October 20	30
	Final Examination	November 3	30
	Short quizzes	TBA*	10
	Oral Presentation	Variable**	30
ESCI 497U	Mid-Term Examination	October 20	20
	Final Examination	November 3	20
	Participation in group field project	October 20	40
	Participation in data analysis	November 3	20

ESCI 497V	Mid-Term Examination	October 20	15
	Final Examination	November 3	15
	Short quizzes	TBA*	10
	Participation in group field project	~November 1	30
	Participation in discussions and workshops	~November 1	30

\*Quiz dates are at the instructors' discretion, and may or may not be announced in advance

\*\*Dates of each student's oral presentation will be assigned at the beginning of the program

Quizzes will cover material that has been presented in recent days. They will be of short duration and may or may not be pre-announced.

Examinations are based mainly on presentation material, including presentations by course instructors, guest lecturers, and fellow students. An understanding of material from the reading assignments is also expected for full credit.

Examinations are 'closed-book' and consist mainly of objective questions, with a few longer, more subjective questions in which students are asked to evaluate an issue. Students are not time-limited on the exams. Exams are graded anonymously.

## V. Grading Scheme

To convert final grade percentages to letter grades for each course that will appear on your transcript, we will use the following grading scheme:

Letter grade	Percentage
A	92.5- 100+
A-	90.0- 92.4
B+	87.5- 89.9
B	82.5- 87.5
B-	80.0- 82.4

Letter grade	Percentage
C+	77.5- 79.9
C	72.5- 77.4
C-	70.0- 72.4
D+	67.5- 69.9
D	62.5- 67.4
D-	60.0- 62.4
F	< 60.0

## VI. General Reminders

*Academic Integrity* is as relevant in this field course as it is at your home institution. Plagiarism, using the ideas or materials of others without giving due credit, cheating, or putting forth another student's work as your own will not be tolerated. Cases of academic dishonesty may be reported to your home institution.

*Assignment deadlines* are necessary so course instructors can get the grading done on time. Therefore, work submitted late may receive a lower grade than equivalent work submitted on time. If you think circumstances may keep you from completing your work on time, talk to the instructor before the assignment is due.

*Participation and attendance* are crucial throughout this project. Because of the demanding schedule and limited time, your presence is required at all program activities. It is your responsibility to communicate with the instructors, to arrive on time, and to be adequately prepared for class presentations and field activities.

Students should feel free to discuss special needs with course instructors. We try to be as flexible and accommodating as we can.

## VII. Academic Schedule & Course Content

**TENTATIVE ITINERARY** (*This itinerary is tentative and may be adjusted as we get closer to the start date.*)

Our program in Kumaon will begin and end in the city of Delhi and will visit three localities in the Himalayan foothills (Sattal, Mukteshwar, and Munsiyari) and two backcountry, high mountain areas (Darma Valley and Ram Ganga Valley). At most locations we will conduct field studies based in tented camps, and we will trek on foot while ponies carry most of our equipment and supplies. The trek in Darma Valley will take us to the highest elevations that we will visit on the program (approximately 14,500 feet elevation, with a campsite slightly higher than 12,000 feet). Here's the current itinerary in a rough, preliminary form. As with any innovative program in a less-developed part of the world, the schedule and timing has to remain tentative until close to the start date. We'll do our best to stick with this plan, and all our field activities will be fascinating, exciting, and academically valuable. We'll share with you a more detailed itinerary once the program starts, but it will always be subject to change.

<b>Date</b>	<b>Location</b>	<b>Main activities and lectures</b>
9/21		Depart home  <b>You will check into the airport the morning of 9/21</b>
9/22	Arrive Delhi evening 9:30 pm, overnight bus to Sattal	Arrive Delhi, transfer by charter bus overnight to Sattal. Meet and greet.
9/23-10/2	Foothill region (Sattal, Mukteshwar)	Field activities: Fieldwork on plant diversity. Bird observation techniques and census methods Cultural field project Presentations: The Himalayas in Indian Culture Hindu religion, attitudes toward nature. Sacred traditions in local conservation Human history (and pre-history) of Himalayan region History of development in the Foothills of Himalayas
10/3-17	Darma Valley	Trekking through Darma Valley  Field activities: Fieldwork on plant diversity. Geology and geomorphology on a transition from foothills to High Himalaya Cultural field studies – agricultural ecology and transhumance Presentations: Mountain Ecosystems Mountain weather and the South Asian Monsoon Landslides and Mountain Hazards Human and Agricultural Ecology of the Darma Valley and 'Bhotiya' people Glaciers Feedback between uplift, erosion, precipitation Transhumance and Alpine Pastoralism. Trans-Himalayan Trade Upper elevation wildlife

10/18	Darchula to Munsiyari	Transfer by jeep down Mahakali River Valley, and up Johor Valley to the town of Munsiyari.
10/18-20	Munsiyari	Midterm examination
10/20-10/30	Trekking and field studies in Ram Ganga Valley	Begin trekking program from Munsiyari, finish in Nachni.  Field activities Cultural field project Field work on plant diversity, agricultural ecology  Lectures: History of social activism in Uttaranchal India, Tibet, and China: resources and geopolitics Trekking tourism in the Himalaya: ecological and socio-economic costs and benefits. Rural livelihoods and the Green Revolution History of establishment of India's National Park system and predator
10/31	Ranikhet	Full-day drive by jeep from Nachni to Ranikhet
11/1-3	Ranikhet	Cultural Activities in Ranikhet.  Wrap-up the classes and learning experiences. Final Examination. Farewells.
11/4	Train to Delhi	Morning jeep transfer to Kathgodam or Ramnagar. Take day-train to Delhi. Transfer to airport for connecting flight home, or begin independent travel.

### VIII. Reading List

Tentative list of readings; final list to come with Course Reader via Dropbox, approximately 4 weeks before project starts. This list is based on the program for 2015, it will be updated in August 2016.

1. Sashi Taroor, *Midnight to Millennium*
2. Traditional Culture and Biodiversity Conservation
3. Ives. *Himalayan Perceptions* Chapter 2 (Geographical Overview)
4. Harka Gurung, Physical and Cultural Patterns in the Himalaya
5. Himalayan Forests and Ecological Generalizations
6. Hinduism brief overview
7. The Indus Civilization (from *Illustrated Cultural History of India*)
8. Reconciling the issue of Subsistence and Cash Crops in Uttarakhand Himalaya
9. *Himalayan Perceptions* (Chapter 4)
10. Declining Transhumance and subtle changes in the Kumaon Himalaya
11. Farooqee – Indigenous Knowledge Systems and Sustainable Management
12. Hoon – *Living on the Move*
13. A Forbidding Kingdom of Snow Leopards
14. The shrinking glaciers of Kilimanjaro: can global warming be blamed?

15. Peter Molnar – Geologic history and structure of the Himalaya
16. Royden – Geological Evolution of the Tibet Plateau
17. *Hindu's of the Himalaya* (Chapter 6)
18. *Losing Ground* (Chapters 5-6)
19. *Himalayan Dilemma* (Chapter 1)
20. Gifts and perils of landslides
21. R. Guha - *The Unquiet Woods* (Chapters 1-2)
22. R. Guha - *The Unquiet Woods* (Chapter 7)
23. Across the Himalayan Gap,
24. Himalayan Histrionics
25. Waters of the Third Pole
26. Himalayan Glaciers: State of the Art Review
27. ICIMOD's position on Climate Change
28. Guidelines for Planning Mountain Protected Areas
29. The India-China Rivalry
30. India and China: Friend, Enemy, River, Investor?
31. Settling the Science on Himalayan Glaciers
32. Lopping Oaks in Central Himalaya, India
33. Landslides Limit Mountain Relief
34. Kailash Sacred Landscapes Feasibility Assessment
35. India's Climate: Monsoon, or Later
36. From Chipko to Climate Change