Tropical Forest Ecology and Management: A Global Perspective
MNR 530

Instructor:
Seema Mangla, OSU Instructor, Department of Forest Ecosystems and Society. seema.mangla@oregonstate.edu

Credits:
3 Credits. This course combines approximately 90 hours of instruction, online activities, and assignments for 3 credits

Prerequisites:
Graduate standing. Highly recommended: Basic ecology course. Recommended: Students should have a bachelor’s degree in the arts, humanities, or science and preferably at least two years of experience working in a natural resources-related field. Instructor approval required for students not meeting prerequisites.

Course description:
Tropical forests are highly productive and ecologically complex natural systems. This course emphasizes the ecology of tropical forests and provides a comprehensive understanding of the common patterns found within tropical forests. The increasing threats and challenges that tropical forests face in the 21st century are assessed and the issues of human use and their impacts are explored in detail. Strategies for sustainable management and restoration approaches to alleviate pressure on remaining tropical forests are discussed. The International Tropical Timber Organization (ITTO) management guidelines are examined. Course material is drawn from broad international forestry research literature. Examples from various tropical forests across the world are used as case studies. A brief introduction of working and travel safety skills in the tropical forests is also covered.

Measurable Student Learning outcomes:
Upon completion of the course, students will demonstrate their ability to:

- Identify some primary drivers and consequences of tropical forests complexity and biodiversity
• Identify and discuss the consequences of key major threats to tropical forests in the 21st century
• Discuss important strategies to mitigate key major threats to tropical forests and discuss the major barriers (social, economic, and political issues) that allow these threats to persist.
• Identify criteria and indicators that are critical of sustainable forest management
• Evaluate the effectiveness of IITO guidelines as they are applied to different tropical forests
• Synthesize and apply concepts and methods for implementing sustainable tropical forest management
• Describe some of the potential hazards of working and travelling in tropical forests

Student mastery of these outcomes will be demonstrated through weekly assignments, class participation in online discussion forums, thoughtful weekly response to other students’ postings, and submission of a final term project. The final term project will include a thorough description of a tropical forest of the students’ choice, a conceptual model that captures the drivers and consequences of tropical forest complexity and biodiversity. It should be a thorough examination of the literature about the increasing threats and challenges that the tropical forest faces, and the policies currently being used to promote sustainable management. Through the final term project, students should be able to synthesize existing literature, concepts, principles, and theories presented throughout the course to develop a plan for sustainably managing tropical forest of their choice.

Class structure:
The course comprises of readings, power-point presentations and videos, discussions on blackboard, weekly assignments and an individual term project.

Textbook:


Textbook Information: NOTE: Both the required textbooks are available as e-book through OSU library. Therefore, using your ONID account, you could read these books online and are also allowed to download the whole book.

Evaluation of Student Performance:
Students will be evaluated based on ten (10) assignments (1 per week), participation on discussion board and a final term project.

Course Grading:
Course grades for MNR 530 will be determined from 10 weekly assignments, course participation via the discussion board on Blackboard, and a term project. The assignments will be posted by the instructor during each week in assignments and as an announcement, and will cover material provided in the readings and power point presentations. The answers to these assignments should be posted on the Blackboard discussion board each week by students. Late answers will be deducted by 25 percent of the maximum allowed points per assignment, i.e. 2.5 points per assignment, unless some prior arrangement has been made with the instructor. The answers to these ten assignments and participation on blackboard form the basis for course participation, which will be taken into account when final grades are issued. It is expected that students will comment on the posting made by other students in the class. Thus:
10 assignments 100 points
Participation on discussion board 100 points
1 term project 50 points
Total 250 points
Grades will be assigned based on a strict point system, i.e. 250 to 225.5 points = A; 225 to 200.5 = B; 200 to 175.5 = C; 175 to 150.5 = D and 150 to 0 = F.

Assignments Description:

Weekly Assignments. An assignment will usually consist of several parts. Be sure to answer all the parts of every assignment and to post your answers on Blackboard each week. Adequate answers will include information from the power point presentation, reading, discussions with other students, colleagues, or the instructor, and other readings, if necessary. It should be possible to complete each assignment in less than a page, but there is no page limitation. An assignment may also be in the form a conceptual model or power-point presentations to cover the topics provided in the class. Students are encouraged to seek information from an array of sources, but each answer should be written in your own unique style.
**Term project.** The term project should be on a tropical forest of the students’ choice. Students will be required to provide a thorough description of a tropical forest of the students’ choice, a conceptual model that captures the drivers and consequences of tropical forest complexity and biodiversity. It should be a thorough examination of the literature about the increasing threats and challenges that the tropical forest faces, policies currently being used to promote sustainable management. Through the final term project, students should be able to synthesize existing literature, concepts, principles, and theories presented throughout the course to develop a plan for sustainably managing tropical forest of their choice.

**Course content and schedule:**

*Note: The journal articles assigned for reading will be made available via blackboard.*

**Week 1**
Lecture 1: Introduction to tropical forests
- Definition of the tropics
- Description of tropical forests?
Weather and climate
- Temperature
- Rainfall
- Humidity and evaporation
- Transpiration
- Factors affecting transpiration
- Sunlight
- Drought and dry periods
- Lighting and Fire


Lecture 2: Diversity and Complexity
- Tropical biodiversity
- Why are tropical forests so diverse?
- The value of biodiversity
- Patterns of species richness
- Complexity of tropical forests

Week 2
Lecture 1: Soils and nutrient cycles
   Tropical Soils
   Nutrient cycling
   Soil and nutrient limitation in tropical forests
   Consequences of resource limitation to plants and animals

Lecture 2: Gap canopy concept
   How they structure tropical forest communities
   Environmental heterogeneity
   Gap dynamics models
   Changes in aboveground patterns and processes
   Belowground effect of canopy gap

Week 3
Lecture 1: Biotic interactions in tropical forests
   Plant-plant interactions
      Physical interactions
      Biogeochemical interactions
      Resource capture (competition for water, light and nutrients)
   Plant-microbe interactions
      Mycorrhiza fungi
      The benefits of mycorrhizal infection
      Do all fungi provide the same benefits?
         Case study: Identifying the role of native fungi in suppressing growth of native plant species.
Lecture 2: Biotic interactions in tropical forests (continued)
Plant-animals interactions
   Seed dispersal in tropical forests
   Herbivory
   Impact on plant defenses
Biotic and abiotic interactions in tropical forests
   Plant and soil interaction
   Role of allelopathy


Week 4
Lecture 1: Climate Change
   Possible impacts of climate change
   Deforestation and climate change
   Adaptation to climate change


Lecture 2: Impact of future climate change
   Fate of the Amazon under climate change: Will Amazonian tropical forests suffer large-scale die-back as a consequence of future climate change, and does experience from the past climate change provides evidence for the future?


Week 5
Lecture 1: Challenges that tropical forest face in the 21st century
   Will tropical forest suffice the 21st century?

Lecture 2: Issues of human use and their impacts: “It all boils down to human”
Unsustainable forestry, illegal logging, overgrazing and agriculture


Week 6
Lecture 1: Deforestation in the tropics
Deforestation in the Amazon
Activities that results in deforestation such as drought, fire, economic activities will be discussed in detail


Lecture 2: Effects of deforestation
Environmental effects of deforestation
Social and economic effects of deforestation
Benefits and cost of deforestation at the International and National levels


Week 7
Lecture 1: Management of tropical forests
Sustainable forestry management
Concept of sustainable forestry
Principles and strategies of sustainability
Strategies to restore remaining forests and techniques to enhance forest regeneration


Lecture 2: Sustainable forestry management (continued)
Strategies to restore remaining forests and techniques to enhance forest regeneration


Week 8

Lecture 1: Tropical forest management guidelines
- Why are new guidelines needed?
- Example: The International Tropical Timber Organization (ITTO) guidelines
- The ITTO guidelines for planted tropical forests

Assigned reading: *The International Tropical Timber Organization (ITTO):* http://www.itto.int/

Lecture 2: Certification of forest management
- The forest stewardship council (FSC) declared ten principles and criteria
- Obstacles to sustainable forest management


Week 9

Lecture 1: Approaches for implementing sustainable management techniques
- Top-down development
- Bottom-up development
- Community forestry
- Globalization


Lecture 2: Locally centered development and integrated natural resource management (INRM)
- INRM example from the Himalayas
- Importance of scale in efficiency of production

**Week 10**
Lecture 1: Tropical forest working and travel safety skills
   This lecture will focus on key essential skills for safe, successful and enjoyable trips to tropical forests. Topics such as basic first aid, illness (heat or tropical), hazards (flora or fauna), snake bites, emergency situations will be covered

Assigned reading: Traveling to the rainforest

Lecture 2: Course Summary
   This lecture will provide summary of all the lectures and topics covered in this course

Term project due

**Learning Resources:**
Learning resources consist of two online lectures each week; readings, supplemental references, online discussions, and website links. Most materials will be provided electronically through the Oregon State University “Blackboard” system, which students may access by logging in at http://my.oregonstate.edu. All students enrolled in this course should have access to a computer with broadband internet access, and be able to read and write MSWord files, prepare figures and tables electronically, and read and create power point presentations or similar programs.

**Academic integrity (OSU policy):** http://oregonstate.edu/admin/stucon/achon.htm
Students are expected to be honest and ethical in their academic work. Intentional acts of academic dishonesty such as cheating or plagiarism may be penalized by imposing an “F” grade in the course.

**Plagiarism:**
You are expected to submit your own work in all your assignments, postings to the discussion board, and other communications, and to clearly give credit to the work of others when you use it. Academic dishonesty will result in a grade of “F.”

Link to Statement of Expectations for Student Conduct:
http://oregonstate.edu/admin/stucon/achon.htm.
Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability and Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

Questions?
We encourage your constructive criticism, suggestions, ideas, and other feedback for improving the course! Please refer to instructor contact information on the first page.

Course Evaluation:
We encourage you to engage in the course evaluation process each term – online, of course. The evaluation form will be available toward the end of each term, and you will be sent instructions through ONID. You will login to “Student Online Services” to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.

Ground Rules for Online Communication & Participation:
☐ Online threaded discussions are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you need to communicate with the instructors only, please use email.
☐ Online Instructor Response Policy: I will check email frequently and will respond to course-related questions within 24 hours Monday through Friday. I often check email on the weekend, but cannot guarantee a response before Monday.
☐ Observation of "Netiquette": All your online communications need to be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your level of professionalism. Do not write as though you are text messaging (i.e., abbreviated words, all caps or all lower case, etc). Those students that do will receive no credit for their submission.
☐ Please check the Announcements area and the course syllabus before you ask general course "housekeeping" questions (i.e. how do I submit assignments, when is something due?). If you don't see your answer there, then please contact me.
Guidelines for a Productive and Effective Online Classroom:
- The discussion board is your space to interact with your colleagues related to current topics or responses to your colleague’s statements. It is expected that each student will participate in a mature and respectful manner.
- Participate actively in the discussions, having completed the readings and thought about the issues.
- Pay close attention to what your classmates write in their online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light, not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best of others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- Disagree with ideas, but do not make personal attacks. Do not demean or embarrass others. Do not make sexist, racist, homophobic, or victim-blaming comments at all.
- Be open to be challenged or confronted on your ideas or prejudices.

Technical Assistance:
If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or if you experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the OSU Computer Helpdesk online.

Writing:
OSU offers a range of resources to assist you in becoming a better academic writer. Specifically, you are encouraged utilize the OSU Online Writing Lab and/or the online tutoring service available free to Ecampus students through NetTutor; both of these services are valuable resources to improve your writing and adherence to APA style.

This course is offered through Oregon State University Extended Campus (ecampus.oregonstate.edu). For more information, email ecampus@oregonstate.edu or call 800-667-1465.