

NREM 480: Applied Forest Ecology Course Syllabus

INSTRUCTOR

Dr. Creighton M. Litton
Sherman Laboratory 240
Department of Natural Resources and Environmental Management
College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa
Phone: 956-6004
Email: litton@hawaii.edu
Course website: <http://www.ctahr.hawaii.edu/LittonC/>

HOURS

Lecture:	TR	9:00 a.m. – 10:15 p.m.	St. John 15
Office Hours:	TW	2:30 p.m. – 3:30 p.m.	Sherman 240
		(or anytime by appointment)	

PREREQUISITES

- NREM 301
- NREM 380
- Or consent (students with similar coursework providing background in soil science, ecology, and forestry)

COURSE DESCRIPTION & OBJECTIVES

This is a 3-credit undergraduate elective course that will explore the foundations for sustainable management of forest resources in Hawai'i and beyond. Sustainable use of forest resources requires, above all, an understanding of basic ecological principles. Applied forest ecology (i.e., management of forest ecosystems) consists primarily of the application of ecological theory to the sustainable management of forest resources. In Hawai'i and throughout the world, forest management spans a variety of land uses and objectives, with the three most important being silviculture (production of timber and non-timber forest products), restoration (restoring structure and function to damaged or degraded forests), and conservation (conserving existing, intact forest resources). In this class, we will first review important baseline ecological principles for forest ecosystems. We will then explore the practical application of this theory to the silviculture, restoration, and conservation of forest resources, with special emphasis on Hawaiian and other tropical forest ecosystems. Topics covered will include:

- Forests & Society (Human Use of Forest Resources)
- Forest Ecosystem Goods & Services
- Forest Ecology
- Silviculture
- Forest Restoration
- Forest Conservation
- Current trends and controversies in applied forest ecology

In each topical area, students are expected to develop an understanding of biological, ecological, and physical principles and concepts, science background, and quantitative skills required to understand and manage forest ecosystems. Specific goals of the course are:

- To learn the basic principles and concepts of forest ecology
- To explore how ecological theory is applied to sustainably manage forest ecosystems
- To introduce current trends and controversies in forest ecology
- To increase awareness of human dependency on forest ecosystems, and the need for sustainable management for present and future generations

EXPECTATIONS

Students: Students are expected to: (i) complete assigned readings prior to lecture/discussion; (ii) arrive to class activities **on time**; (iii) be respectful of fellow students and the instructor during all class activities; (iv) be an active participant in class; and (v) work positively with the other students in the course.

Instructor: The primary goal of the instructor is to make the course useful and, ideally, enjoyable. The instructor will: (i) be punctual, prepared, and enthusiastic for course activities; (ii) communicate clearly the course objectives, policies, and assignments; (iii) listen carefully to questions and concerns; (iv) grade assignments and exams fairly and return them in a timely manner; and (v) be available during and outside of office hours to provide guidance and assistance.

COURSE STRUCTURE / APPROACH

Classes will be taught in an interactive lecture format. Students are expected to participate actively in all aspects of the course. Lectures will primarily cover assigned readings and associated primary literature, and will include active participation by students. Periodically, class will consist of a discussion based on an assigned reading and/or case study. In as much, it is **very important that you complete the assigned readings prior to each class** so that you can better participate in the lecture/discussion for that day. Lectures and discussions are meant to be fun, interactive, stimulating, and informative (not intimidating, boring, and arduous).

LECTURES

Lectures will focus on presentation of core material and key concepts from the course readings. Questions and discussion are always encouraged during lectures. There is no lab component to this course.

TERM PAPER AND PRESENTATION

Each student will complete a term paper that focuses on an area of individual interest covered during the semester (i.e., you will write a paper on some aspect of applied forest ecology covered during the course that you find intriguing and important). In addition, each student will give a presentation (15-20 minutes) on their chosen topic during the last 2 weeks of class. Additional information and details on the term paper and presentation will be provided later in the semester, but start thinking now about a topic that you would like to concentrate on.

READING ASSIGNMENTS

There is no course textbook. Lectures and reading assignments for each week will consist of a selected reading(s) from a variety of textbooks (see partial list below). Readings from the primary literature (i.e., scientific journals) may also be assigned for some lectures. As the assigned readings are somewhat subject to change, students will be provided a copy of the selected readings and/or they will be available to download from the course website. Reading assignments are to be completed **prior** to the corresponding lecture.

TEXTBOOKS FOR COURSE READINGS:

- Barnes, B.V., Zak, D.R., Denton, S.R., and Spurr, S.H. 1998. *Forest Ecology* (4th ed). John Wiley & Sons, Inc., New York. 774 p.
- Evans, J. and Turnbull, J. 2004. *Plantation Forestry in the Tropics* (3rd ed). Oxford University Press, Oxford. 467 p.

Kelty, M.J., Larson, B.C., and Oliver, C.D. (eds). 1992. *The Ecology and Silviculture of Mixed-Species Forests*. Kluwer Academic Publishers, Boston. 287 p.

Kimmins, J.P. 2004. *Forest ecology (3rd ed)*. Macmillan Publishing Group, New York. 720 p.

Montagnini, F. and Jordan, C.F. 2005. *Tropical Forest Ecology: The Basis for Conservation and Management*. Springer, New York. 295 p.

Newman, E.I. 2000. *Applied Ecology and Environmental Management (2nd ed)*. Blackwell Science, Oxford. 396 p.

Newton, A.C. 2007. *Forest Ecology and Conservation*. Oxford University Press, Oxford. 454 p.

Nyland, R.D. 2002. *Silviculture: Concepts and Applications*. Waveland Press, Inc., Illinois. 682 p.

Oliver, C.D. and Larson, B.C. 1996. *Forest Stand Dynamics*. John Wiley & Sons, Inc., New York. 520 p.

Perry, D.A., Oren, R., and Hart, S. C. 2008. *Forest Ecosystems (2nd ed)*. The Johns Hopkins University Press, Baltimore. 632 p.

Smith, D.M., Larson, B.C., Kelty, M.J., and Ashton, P.M.S. 1997. *The Practice of Silviculture: Applied Forest Ecology*. John Wiley & Sons, Inc., New York. 537 p.

Vogt, K.A., Honea, J., Vogt, D.J., Andreu M., Edmonds, R., Sigurdardóttir, R., and Patel-Weynande, T. (eds). 2007. *Forests and Society: Sustainability and Life Cycles of Forests in Human Landscapes*. CAB International, Cambridge. 335 p.

Whitmore, T.C. 1998. *An Introduction to Tropical Rain Forests (2nd ed)*. Oxford University Press, Oxford. 282 p.

STUDENT EVALUATION

Grading will be assessed by giving weight to each of the 5 categories listed in the table below. **Class attendance is mandatory.** All students are expected to read required materials prior to class (see Course Schedule, below), and **come prepared to participate** (analyze, discuss, ask questions, etc.) in the topics/literature/case studies for that day. Students are responsible for obtaining readings, notes, & handouts from the instructor, their classmates or the course website, and for keeping track of assignments and grades.

GRADING ASSIGNMENTS

Activity	Points	% of Grade
Participation*	50	10
Midterm Exam I	100	20
Midterm Exam II	100	20
Term Paper	75	15
Term Presentation	75	15
Final Exam	100	20
Total Points	500	100

*Participation grade will be based on attendance, punctuality, attitude, and active engagement in class discussions and other activities throughout the semester.

Grading Scale (based on a total of 500 points)

A+	$x \geq 97\%$	B+	$90 > x \geq 87$	C+	$80 > x \geq 77$	D+	$70 > x \geq 67$
A	$97 > x \geq 94$	B	$87 > x \geq 84$	C	$77 > x \geq 74$	D	$67 > x \geq 64$
A-	$94 > x \geq 90$	B-	$84 > x \geq 80$	C-	$74 > x \geq 70$	F	$x < 64\%$

POLICIES

- Students are responsible for obtaining readings, lecture notes, and handouts from the instructor, classmates or course website, and for keeping track of assignments and grades.
- **If a student has >5 unexcused absences, the student will receive a 0 for their participation grade.**
- **If a student has 10 or more unexcused absences for the semester, the student will receive an F for their final grade in this course.**
- Late submissions and/or makeup exams will only be accepted for the following cases:
 - 1) Emergency cases (e.g., illness, family emergencies); require prior approval by the instructor with a doctor's note, a copy of student's itinerary, etc.
 - 2) Absences due to illness without a doctor's note require students to contact the instructors before or within 24 hours of missed event (i.e., report due, exam).

ACADEMIC INTEGRITY

Students are expected to conduct themselves with the utmost integrity. The *University of Hawai'i at Mānoa Student Conduct Code* (<http://www.manoa.hawaii.edu/students/conduct/>) defines cheating and plagiarism as follows:

CHEATING includes but is not limited to giving or receiving unauthorized assistance during an examination; obtaining unauthorized information about an examination before it is given; submitting another's work as one's own; using prohibited sources of information during an examination; fabricating or falsifying data in experiments and other research; altering the record of any grade; altering answers after an examination has been submitted; falsifying any official University record; or misrepresenting of facts in order to obtain exemptions from course requirements.

PLAGIARISM includes but is not limited to submitting, in fulfillment of an academic requirement, any work that has been copied in whole or in part from another individual's work without attributing that borrowed portion to the individual; neglecting to identify as a quotation another's idea and particular phrasing that was not assimilated into the student's language and style or paraphrasing a passage so that the reader is misled as to the source; submitting the same written or oral or artistic material in more than one course without obtaining authorization from the instructors involved; or "drylabbing," which includes obtaining and using experimental data and laboratory write-ups from other sections of a course or from previous terms.

If you ever have any questions about what constitutes fair academic play, please come and talk to me. Cheating or plagiarism will result in an F for your final grade in the course. It may also lead to other serious academic repercussions beyond this course (see *University of Hawai'i at Mānoa Student Conduct Code*; <http://www.manoa.hawaii.edu/students/conduct/>).

ACCOMMODATIONS FOR DISABILITIES:

If you feel you need reasonable accommodations because of the impact of a disability, please: (1) contact the KOKUA Program (V/T) at 956-7511 or 956-7612 in room 013 of the QLCSS; and (2) speak with one of the instructors privately to discuss your specific needs. We will be happy to work with you and the KOKUA Program to meet your access needs related to your documented disability.

FINAL CAVEAT

All material on this syllabus is subject to change at my discretion to suit the needs of the course.

COURSE SCHEDULE

Week	Date	Lecture (TR 9:00–10:15)	Reading Assignment
1	1/13 (T)	Course Introduction	<i>Syllabus</i>
	1/15 (R)	Forests & Society	Kimmins 2004 (p. 3-22); Vogt <i>et al.</i> 2007 (p. 30-44)
2	1/20 (T)	The Ecosystem Concept and Forest Ecosystem Goods & Services	Kimmins 2004 (p. 25-34); MEA, 2005 (p. 1-18)
	1/22 (R)	Forest Population & Community Ecology	Kimmins 2004 (p. 367-440)
3	1/27 (T)	Abiotic Environment (Climate, Light, Wind, Water)	Kimmins 2004 (p. 169-283)
	1/29 (R)	Soil Resource	Perry <i>et al.</i> 2008 (p. 256-300)
4	2/3 (T)	Disturbances & Succession	Perry <i>et al.</i> 2008 (p. 118-155)
	2/5 (R)	Production Ecology	Perry <i>et al.</i> 2008 (p. 301-323)
5	2/10 (T)	Forest Nutrition & Biogeochemistry	Perry <i>et al.</i> 2008 (p. 333-339; 347-370; 372-384)
	2/12 (R)	Forest Silviculture – Introduction	Smith <i>et al.</i> 1997 (p. 3-19)
6	2/17 (T)	Forest Silviculture – Stand Dynamics	Smith <i>et al.</i> 1997 (p. 20-43)
	2/19 (R)	- Catch up day -	<i>No Reading</i>
7	2/24 (T)	Midterm Exam I	<i>No Reading</i>
	2/26 (R)	Forest Silviculture – Management of Growth & Yield	Smith <i>et al.</i> 1997 (p. 69-98)
8	3/3 (T)	Forest Silviculture – Systems & Methods of Regeneration	Smith <i>et al.</i> 1997 (p. 301-315)
	3/5 (R)	Forest Silviculture – Plantation Forestry	Smith <i>et al.</i> 1997 (p. 316-329)
9	3/10 (T)	Forest Silviculture – Mixed Species Forestry	Smith <i>et al.</i> 1997 (p. 391-419)
	3/12 (R)	Forest Restoration – Introduction	SER 2004 (p. 1-13)
10	3/17 (T)	Forest Restoration – Communities & Ecosystems	Newman 2000 (p. 322-344)
	3/19 (R)	Forest Restoration – Invasive Species	D'Antonio & Chambers 2006 (p. 260-275)
Spring Break (3/23 – 3/27)			
11	3/31(T)	Forest Restoration – Case Study: Restoring Degraded Rainforest	Vogt <i>et al.</i> 2007 (p. 253-254)
	4/2 (R)	Forest Conservation – Introduction	Newman 2000 (p. 281-321)
12	4/7 (T)	Forest Conservation – Conserving Species or Habitat?	Perry <i>et al.</i> 2008 (480-502)
	4/9 (R)	Forest Conservation – Effective Management	Newton 2007 (p. 332-378)
13	4/14 (T)	Forest Conservation – Case Study: Coqui Frogs in Hawai'i	Vogt <i>et al.</i> 2007 (p. 135-137)
	4/16(R)	- Catch up day -	<i>No Reading</i>
14	4/21 (T)	Midterm Exam II	<i>No Reading</i>
	4/23(R)	Student Presentations	<i>No Reading</i>
15	4/28(T)	Student Presentations	<i>No Reading</i>
	4/30 (R)	Student Presentations	<i>No Reading</i>
16	5/5 (T)	Course Evaluation (Term Papers Due)	<i>No Reading</i>
Final Exam: May 12 9:45 a.m.			