DETAILED COURSE DESCRIPTION
FOR 677 Advanced Forest Management

COURSE DEFINITION:
FOR 677 Advanced Forest Management
Shared Resource: none
Instructor: C. J. Davis

3 hour(s) lecture per week
0 hour(s) discussion or seminar per week
0 hour(s) field work/field trip/laboratory/studio per week
0 hour(s) recitation per week

3 credit hours Spring
Pre- or co-requisite(s): Prerequisites: Forest Management and Probability and Statistics

SCOPE:

Level of Instruction:
The course is designed for graduate students.

Content:

Major Concepts or Methodologies:
1. Review of linear programming approaches to forest management.
2. Identification of weaknesses in the linear programming approach.
4. Techniques for dealing with random right-hand-sides in forest management optimization problems.
5. Techniques for dealing with random technical coefficients in forest management optimization problems.
6. Applications of the MAXMIN approach in forest management.
7. Methods of modeling dynamic nonlinearities in managed forest ecosystems.
8. Techniques for spatial optimization in managed forest ecosystems.

Course emphasis is on identification of weaknesses in traditional linear programming approaches to forest management and methods for dealing with these weaknesses. It covers methods for dealing with risk and uncertainty, techniques for modeling dynamic nonlinearities, and spatial optimization in the management of forest ecosystems.

Relation to curriculum or to other ESF or Syracuse University courses:
The course provides advanced quantitative techniques to support decision making for managed forest ecosystems. The course builds on the foundations of probability and statistics in APM 510 and the basic material presented in undergraduate forest management courses.

OBJECTIVES:
After completing this course the student should be able to:
1. Identify situations in forest management planning where the linear programming approach is inappropriate.
2. Formulate and solve forest management planning problems that account for risk and uncertainty.
3. Formulate and solve forest management planning problems employing the MAXMIN approach.
4. Develop forest planning models that account for the dynamic nonlinearities inherent in biological systems.
5. Formulate and solve forest management planning problem that include spatial relationships.
INSTRUCTIONAL FORMAT AND MATERIALS:
Format: Three hours of lecture per week during the spring semester.

Materials: Lectures serve as the means for introducing the major topics of the course. Assigned readings in forest management textbooks and recent journal articles serve as a supplementary source. Homework exercises serve as the primary means to elaborate upon the lectures and to give "hands-on" experience in the analytical techniques discussed. Course grades are based on homework assignments and a research project/paper.

INSTITUTIONAL RESOURCES REQUIRED (INSTITUTIONAL IMPACT):
Standard classroom space with chalk or dry erase board, overhead projector, and screen is required. Expected enrollment: 10 students. Current library holdings are sufficient. Students will require access to computing facilities, either personal or campus clusters, for approximately 6 hours per week. Word processing and spreadsheets will be the most commonly used software. Duplication of approximately 50 pages per student.

HEALTH AND SAFETY CONSIDERATIONS:
Health and Safety Considerations to be Specifically Addressed.

<table>
<thead>
<tr>
<th>Conditions or situations present in association with the course?</th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1. Will substances with any of the following properties be used during instruction: flammability, toxicity, corrosivity,</td>
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<td>reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury?</td>
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<td>2. Will any physical hazards be present during instruction? (e.g., machines that need safety guards; razor blades or syringes;</td>
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<td>compressed gases, etc.).</td>
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<td>3. Will any biological hazards be present during instruction? (e.g., handling animals (rabies or hantavirus); cultures or</td>
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<td>stocks of infectious agents (fungal spores, viruses, bacteria, etc.).</td>
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<td>4. Will any radiation hazards be present during instruction? (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.).</td>
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<td>5. Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during</td>
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<td>instruction? (Give considerable thought to electrical use outdoors, or any potentially wet location.).</td>
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<td>6. Will there be any personal safety issues related to the class? (e.g., due to time of day or location, at the end of any</td>
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<td>organized class exercise, will students be in danger of physical assault, etc.).</td>
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<td>7. Will any students be driving official State or research sponsored land or water vehicles during any class or instructional</td>
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<td>exercise?</td>
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<td>8. Will any type of personal protective equipment be necessary during class exercises? (e.g., hard-hats, eye/face protection,</td>
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<td>hearing protection, hand/foot protection, lab coat, visibility clothing, etc.)</td>
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Health and Safety Considerations Narrative: This is an indoor class. No hazardous conditions or health and safety issues are anticipated in the classroom.
CATALOG DESCRIPTION:
FOR 677  Advanced Forest Management  (3)
Quantitative approaches to the management of forest ecosystems. Methods and techniques for accounting
for risk and uncertainty, extending the nondeclining yield concept to multiresource problems, modeling
dynamic nonlinearities in managed ecosystems, and spatial optimization in forest management. Spring

Pre- or co-requisite(s): Prerequisites: Forest Management and Probability and Statistics

COURSE HISTORY:
This is a new course. It was taught three times as an experimental course (FOR 796)

Last updated: 23 April 2001