

## SYLLABUS

### FO-8243 - ADVANCED FOREST RESOURCE MANAGEMENT & PLANNING SPRING 2006

#### INSTRUCTOR:

Dr. Ian A. Munn      Office: 349 Thompson Hall    Phone: 325-4546  
Office Hours: 11:00am - 12:00 noon T-TH  
(Please make an appointment whenever possible)

#### TIME/PLACE:

2:00pm – 3:15 pm T-TH 208 Thompson Hall Annex

#### COURSE OBJECTIVES:

To present the concepts, techniques, and tools required to manage the flow of goods and services from the forest. Specific topics to be covered include financial analysis, valuation of forest products including non-market goods, growth and yield models, stand management, harvest scheduling, and forest regulation.

To review the application of mathematical programming techniques such as linear programming, goal programming and dynamic programming to forest management problems.

To present basic modeling techniques used to analyze forest resource management problems.

To present current issues in forest resource management.

To provide students experience in presentation of scientific material in a class room setting.

#### COURSE FORMAT:

Lectures, class discussions and lab demonstrations by the instructor **and the students** will be utilized to present the materials covered in this course. Student participation is both expected and essential.

#### TEXT:

Davis, L.S., K.N. Johnson, P.S. Bettinger, and T.E. Howard. 2001. Forest Management, 4th edition. McGraw-Hill, New York.

## GRADING:

Course grades will be based on class participation, a mid-term exam, periodic reports, and a term project. Course grades will be awarded as follows:

A -90%+  
B - 80%-89%  
C - 70%-79%  
NC - below 70%

Class Participation: 5 pts  
1st exam: 30 pts  
Lecture: 10 pts  
Reports: 25 pts  
Term Project 30 pts  
2<sup>nd</sup> Exam 30 pts

Class Participation: Students will be evaluated on their participation in in-class discussions. Both the quality and quantity of student input will be considered.

1<sup>st</sup> Exam: This exam will cover all prior lectures, reading assignments, lab assignments and class discussions.

Lecture: Each student will be required to give one or more lectures. Students may select any class date and topic after March 25<sup>th</sup> and lead the appropriate lab or discussion session. Students may select their lecture topics on a first-come, first-serve basis. Students may develop their own topic subject to the instructor's approval.

Reports: Students will be required to submit written reports on lab, reading assignments, and student projects throughout the semester.

Term Project: Each student is required to complete a project, present the results to the class (5 %) and submit a written report (20%). Acceptable projects include traditional term papers, case studies, comprehensive literature reviews, or research papers but must utilize the concepts and materials relevant to forest management. Format of the written report will adhere to *Forest Science* guidelines. Term projects **will not** cover the same material as the lecture topic selected by the student. Each student will formally review/critique another student's project (5%).

2<sup>nd</sup> Exam: This exam will cover all prior lectures, reading assignments, lab assignments, class discussions, and student projects. Some students may be excused from the taking this test at the discretion of the instructor.

Table 1. Tentative Course Schedule and Assigned Readings - FO 8243

Date:	Topic:	Suggested Reading
Jan. 19	Introduction/Growth and Yield	Davis et al. - Chapt 5, Matney & Farrar, Daniels and Burkhart (pp:1-33)
Jan. 24	MFA Annual Meeting (no class - attendance encouraged)	
Jan. 26	Optimal Rotation Ages-Biological & Financial	Davis et al - Chapt. 4, Samuelson (1976), Chang (1984), Faustmann (1849)
Jan. 31	Valuation - Market Goods, Non Market Goods (CVM) (TC)	Davis et al - Chapt 8, Ecosystem Valuation – Contingent Valuation Method Ecosystem Valuation – Travel Cost Method, , Pearse and Holmes (1993)
Feb. 2	Classical Forest Management	Davis et al - Chapt 10
Feb. 7	Linear Programming/Lindo Review	Davis et al - Chapt 6, Dykstra – Chapt 2 & 3, Lindo Manual
Feb. 9	Basic Timber LP Formulation	Johnson and Scheurman (1977),
Feb. 14	Basic Timber LP Formulation	Nautiyal and Pearce (1967)
Feb. 16	LP Formulation (cont.)	
Feb. 21	Spatial Issues	Murray (1999), McDill and Braze (2000)
Feb. 23	Spatial Issues	Carter et al. (1997), Murray (1998a), Van Duesen (1999), Clements et al. (1990) Boston and Bettinger (1999)
Feb. 28	Goal Programming/GP Example	Dykstra - Chap 8., Field (1973), Hotvedt (1983)
March 2	Habitat/Wildlife Management	Roloff et al. (1999), <i>Hof and Joyce (1992)</i> ,
March 7	Habitat/Wildlife Management	<i>Hof and Raphael (1993)</i> , <i>Hof et al. (1994)</i> , <i>Haight and Travis (1997)</i>
Mar. 9	EXAM	Study Plan for Term Project Due 5pm
Mar. 14	Spring Break	
Mar. 16	Spring Break	
March 21	TBA	
March 23	SOFEW (No class – attendance encouraged)	
Mar. 28	Planning under Uncertainty	<i>Braze &amp; Mendelsohn (1988)</i> , <i>Kongsom (2002)</i>
Mar. 30	Planning under Uncertainty	<i>Pickens &amp; Dress (1988)</i> , <i>Gassman (1989)</i> <i>Marshall (1987)</i>
	Eco-system Management	<i>Grumbine (1993)</i> , <i>Slocombe (1993)</i> <i>Sedjo (1995)</i> , <i>Rowe (1992)</i> , <i>Cubbage (1995)</i>
Apr. 4	Sustainable Forestry	<i>Webster (1993)</i> , <i>Romm (1994)</i> <i>AFPA (1995)</i> , <i>Oliver(2003)</i>
Apr. 6	Certification	<i>Journal of Forestry, April 1995 Issue</i>
Apr. 11	Conservation Easements	
Apr. 13	Carbon Sequestration	
Apr. 15	Student Presentations- Term Projects	
Apr. 20	Student Presentations- Term Projects	
Apr. 22	Student Presentation-Term Project	
Apr. 27.	Marketable Harvesting Permits	
Apr. 27	EXAM	
Apr. 28	Final Version – term project due	

## ACADEMIC MISCONDUCT:

The maximum sanctions available to the course instructor will be imposed upon any student found guilty of academic misconduct. What constitutes academic misconduct and the maximum sanctions are described in the University's Academic Operating Policy AOP 12.07 - Academic Misconduct and can be found on Mississippi State University's web page: <http://www.msstate.edu/dept/audit/mainindex.html> under Student Affairs – Code of Student Conduct.

### References:

- Johnson, K. H. and H. L. Scheurman. 1977. Techniques for prescribing optimal timber harvest and investment under different objectives – discussion and synthesis. Forest Science Monograph 18.
- Nautiyal, J.C. and P.H. Pearse. 1967. Optimizing the conversion to sustained yield: A programming solution. Forest Science 13(2):131-139.
- Faustmann, M. 1849. Calculation of the value which forest land and immature stands possess for forestry. reprinted in: Journal of Forest Economics 1995 1(1):7-44.
- Samuelson, P. A. 1976. Economics of forestry in an evolving society. reprinted from the original in: Journal of Forest Economics 1995 1(1):115-149.
- Chang, S.J., 1984. Determination of the optimal rotation age: A theoretical analysis. Forest Ecology and Management 8:137-147.
- Ecosystem Valuation – Travel Cost Method. [http://www.ecosystemvaluation.org/travel\\_cost.htm](http://www.ecosystemvaluation.org/travel_cost.htm)
- Ecosystem Valuation – Contingent Valuation Method.  
[http://www.ecosystemvaluation.org/contingent\\_valuation.htm](http://www.ecosystemvaluation.org/contingent_valuation.htm)
- Pearse, P.H. and T.P. Holmes. 1993. Accounting for nonmarket benefits in southern forest management. Southern Journal of Applied Forestry 17(2):84-89.
- Field, D.B. 1973. Goal programming for forest management. Forest Science 19(2):125-135.
- Hotvedt, J.E. 1983. Application of linear goal programming to forest harvest scheduling. Southern Journal of Agricultural Economics. 1983:103-108.
- Murray, A. T. 1999. Spatial restrictions in harvest scheduling. 45(1):45-52.
- Carter D.R., M. Voiatiz, C.B. Moss, and L.K. Arvanitis. 1997. Ecosystem Management or infeasible guidelines? Implications of adjacency restrictions for wildlife habitat and timber production. Can. J. For. Res.27:1302-1310.
- Murray, A. T. 1998. Ecosystem Management or infeasible guidelines? Implications of adjacency restrictions for wildlife habitat and timber production – Discussion and Reply. Can. J. For. Res.28:1093-1096.

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- Boston, K. and P. Bettinger. 1999. An analysis of Monte Carlo integer programming, Simulated annealing, and tabu search heuristics for solving spatial harvest scheduling problems. *Forest Science* 45(2):292-301
- Roloff, G.J., B. Carroll, and S. Scharosch. 1999. A decision support system for incorporating wildlife habitat quality into forest planning. *Western journal of Applied Forestry* 14(2):91-99.
- Haight, R.G. and L. E. Travis. 1997. Wildlife conservation planning using stochastic optimization and importance sampling. *Forest Science* 43(1):129-139.
- Hof, J.G. and L.A. Joyce. 1992. Spatial Optimization for wildlife and timber in managed forest ecosystems. *Forest Science* 38(3):489-508.
- Hof, J. G. and M.G. Raphael. 1993. Some mathematical programming approaches for optimizing timber age-class distributions to meet multispecies wildlife population objectives. *Canadian Journal of Forest Research* 23:828-834.
- Hof, J.G., M. Bevers, L. Joyce, and B. Kent. 1994. An integer programming approach for spatially and temporally optimizing wildlife populations. *Forest Science* 40(1):177-191.