WDSC 422
HARVESTING FOREST PRODUCTS
Fall Semester 2019
http://jingxinwang.forestry.wvu.edu/teaching/wdsc422

Time and Location:	Lectures:	8:00am - 8:50am M&W in 204 Percival Hall
	Labs:	2:00pm - 4:50pm M in 204 Percival or outside
Final Exam:		Tuesday, December 17, 5:00PM to 7:00 PM
Instructors:		Dr. Jingxin Wang, 317E, Percival Hall (304) 293 7601, jxwang@wvu.edu
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		John Vance, G248 Ag Science Bldg. jvance11@mail.wvu.edu
		Xufeng Zhang, 206B, Percival Hall xz0017@mix.wvu.edu
Office Hours:		9-11am Monday or by appointment

COURSE OBJECTIVES

Upon completion of this course, the students will have a better understanding of:
(1) brief history of timber harvesting, modern logging equipment, methods, and systems,
(2) timber harvesting business in central Appalachia
(3) methods of estimating logging productivity and costs,
(4) biomass harvesting and analysis for bioenergy and bioproducts,
(5) forest road design and construction, and
(6) regulations and legislations, such as logging safety (OSHA), logging sediment control (LSCA), best management practices (BMPs), and others affecting logging business and procurement functions.

TEXTBOOK

A teaching packet entitled "Forest and Biomass Harvesting and Analysis" is required for this class. A reference textbook is recommended for this course: "Logging and Pulpwood Production (second edition)" by Stenzel, Walbridge, and Pearce published by John Wiley & Sons, Inc. in 1985. Other material distributed by the instructor will be used for reading assignments and background materials.

STUDENT MATERIALS REQUIRED

Personal Protective Equipment (PPE) including hardhat, safety boots, eye and ear protection may be required to be worn for the field trips to local logging operations and mill tours. A USB drive is also required to store lab reports, computer programs, other related calculations or maps.

GRADING

Exam 1	20%
Exam 2	20%
Final Exam	30%
Lab Reports	20%
Homework	5%
Attendance	5%

There will be two mid-term exams that account for 40% of the final grade, while the comprehensive final exam will be 30% of the final grade. Typed lab reports will be due from lab exercises and field trips. Calculations, maps, and other information should be included as attachments to the report as needed. Two or three homework assignments will be also given during the semester to allow the students to practice logging production and cost estimations. Lab reports and homework assignments will be graded on technical content, proper numerical reporting, correct spelling, and proper English usage. Late assignments are not accepted for credit without prior approval.

Grading Scale		
	>= 90	A
	80 – 89	B
	70 – 79	C
	60 – 69	D
	<60	F

ACADEMIC INTEGRITY STATEMENT

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy (http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

INCLUSIVITY STATEMENT

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the Office of Accessibility Services. (https://accessibilityservices.wvu.edu/)

More information is available at the Division of Diversity, Equity, and Inclusion (https://diversity.wvu.edu/) as well.

ADDITIONAL REFERENCES

Clarkson, R. 1998. Tumult on the Mountains – Lumbering in West Virginia 1770 – 1920. McClain Printing Company, Parsons, West Virginia.

Conway, S. 1982. Logging practices: Principles of timber harvesting systems (revised edition). Miller Freeman Publications, San Francisco. 416pp.

Egan, A.F. 1999. Forest Roads: Where Soil and Water Don't Mix. Journal of Forestry 97(8):18 - 21.)

Jackson, B. 1992. Guide to Permanent Unpaved Roads on Wet Soils. The University of Georgia. http://warnell.forestry.uga.edu/warnell/service/library/index.php3?docID=268&docHistory%5B%5D=11

Stokes, B. J., C. Ashmore, D. L. Rawlins, and D. L. Sirois. 1989. Glossary of terms used in timber harvesting and forest engineering. USDA Forest Service, GTR No. SO-73.

Walbridge, T.A. 1997. The Location of Forest Roads. Virginia Tech, Blacksburg, VA.

Wenger, K. F. (ed.). 1984. Forestry Handbook (2nd Edition). John Wiley & Sons, New York.

Wiest, R.L., 1998. A Landowner's Guide to Building Forest Access Roads, USDA Forest Service. Northeastern Area State and Private Forestry. NA-TP-06-98. (Available online at: http://www.na.fs.fed.us/spfo/pubs/stewardship/accessroads/accessroads.htm)

Journals
International Journal of Forest Engineering
Forest Products Journal
Journal of Forestry
Wood and Fiber Science
Forest Science
Canadian Journal of Forest Research
Forest Ecology and Management

Tentative Class Schedule

Week	Date	Lectures and Labs
1	8/21	Introduction and Terminology
2	8/26 8/26	Forests and Logging Business Lab 1: Timber harvesting technology review (Room 204) Slide and video show – logging history
	8/28	Felling Methods
3	9/2	*LABOR DAY RECESS: UNIVERSITY CLOSED*
	9/4	Ground-based Extraction
4	9/9 9/9	Delimbing and Bucking Lab 2: Skidder Productivity Analysis (Computer Lab 317)
	9/11	Loading and Transportation
5	9/16 9/16	Biomass Harvest Systems and Logistics Lab 3: Truck Axle Weight Laws and Calculations (Room 204)
	9/18	Cable and Aerial Logging Systems
6	9/23 9/23	Chipping and Wetland Systems Lab 4: Chainsaw Felling Safety and Equipment Demonstration - University Forest (Field)
	9/25	Thinning Systems
7	9/30 9/30	Interactions of stands, harvests, and machines – system introduction and application LAB 5: Harvesting Simulation Analysis (Computer lab 317)
	10/2	**EXAM #1**
8	10/7 10/7	Production Estimation I Lab 6: Local Conventional Logging Operations (Field) **Homework Assignment 1**
	10/9	Production Estimation II
9	10/14 10/14	Cost Estimation Lab 7: Local Mechanized Logging Operations (Field) **Homework Assignment 2**
	10/16	Logging System Analysis I
10	10/21 10/21	Logging System Analysis II Lab 8: Logging System Analysis (Computer lab 317) **Homework Assignment 3**
	10/23	Logging Safety, OSHA, Workers Compensation Insurance
11	10/28 10/28	Forest Road Location and Design Lab 9: Paper Road Layout (Room 204)
	10/30	Ditches, Culverts, Bridges, and other Forest Road Structures

12	11/4 11/4 11/6	Horizontal and Vertical Curves Lab 10: Horizontal Curve Layout (Room 204) Earthwork and Construction
13	11/11 11/11 11/13	Computer road design Lab 11: RoadEng (Computer lab 317) Road Costing
14	11/18 11/18 11/20	Site Impacts and Best Management Practices (BMPs) Lab 12: BMP Compliance Check on Local Logging Operation (Field) **EXAM #2**
15	11/25 11/27	*THANKSGIVING RECESS: UNIVERSITY CLOSED*
16	12/2 12/2 12/4	Harvest Planning Lab 13: Harvest Planning Project (Computer lab 317) Timber Sales and Contract Services
17	12/9 12/9 12/11	Antitrust Laws and Other Legal Issues in Logging Lab 14: Harvest Planning Project - continued (Computer lab 317) Harvest Planning Report Due, Final Review and Wrap-up
18	12/17	**FINAL EXAM** - Tuesday, December 17, 2019 5pm – 7pm