



# Hardwood University



## *Educational Opportunities for you and your employees*

### Goal

Provide hardwood industry professionals with information and training on sustainability of material supply, best management practices, procurement and marketing, tree, log and lumber quality and measurement, step-by-step processing techniques, equipment and decision-making.

### Audience

- Employees new to the hardwood industry
- Employees that are preparing for advancement, cross-training, etc.

### Organized by

Purdue University Department of Forestry and Natural Resources  
Indiana Hardwood Lumbermen's Association

### Instructors

Prof. Rado Gazo  
Prof. Eva Haviarova  
Subject matter guest speakers as needed

### When and where

This is an annual, once per month program consisting of nine events. Participants will receive an attendance certificate and those that complete all nine events in a chosen track within a 2-year period will receive an IHLA/Purdue recognition of program completion.

### Program – (3 different tracks)

- Primary Industry - focused on log buyers, sawmill, stave mill, veneer mill, lumber drying operators
- Secondary Industry - focused on furniture, cabinet, millwork and other manufacturers of wood products
- Training a-la-carte - designed for companies and individuals that would like to organize in-house training on a selected topic

### Cost

1. **\$79 per person per course.** Registration and payment done on a course-by-course basis. Upcoming course will be listed on the IHLA website and reminders will be sent via email for each course.
2. **\$999 per year for a “Hardwood University One-Pay” pass.** Companies choosing this option can send up to 4 employees to any class, all for one annual fee. Instead of making decisions on a course-by-course basis, the employer's only decision will be “who do I send?”

## Primary Industry Curriculum

<b>April 27-29, 2021</b>	<b>Hardwood 101 Industry Tour</b>	<b>Indiana</b>
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Visit a tree farm, logging job, sawmill, veneer mill, drying yard, and furniture or cabinet manufacturer. Discuss industry processes, challenges and opportunities with principal owners or managers. Gain understanding of industry vocabulary, supply chain and connection to upstream and downstream processes (Gazo). **3 Day Tour**

<b>May 19, 2021</b>	<b>Intro to Hardwood Lumber Quality/Grading</b>	<b>Purdue</b>
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Basic overview of reasons for grading lumber, measurement of boards and NHLA lumber grading rules. Limited practice of grading sample boards. Discuss how log quality affects lumber grade and how head sawyer, resaw, edger and trimmer operators can maximize value potential (Gazo). **1 Day**

<b>August 25, 2021</b>	<b>Marketing Hardwood Veneer, Stave, Saw Logs</b>	<b>Edinburgh</b>
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Discuss tree quality & log merchandising. The highest-value use of our hardwood resource is for fine face veneers. Excellent markets have always existed for "perfect" trees and logs. Marketing of "some-what less than perfect" trees and logs can present a challenge. The practicing forester may not be exactly sure what a particular veneer buyer can accept and why log or tree value can vary widely and change weekly. Furthermore, the markets for the veneer itself change (Gazo, guest speaker). **1 Day**

<b>Sept. 22, 2021</b>	<b>Tree &amp; Log Quality, Scaling and Measurement</b>	<b>Purdue</b>
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Observe standing trees and discuss tree grades. Practice tree grading on selected trees. Fell a tree and discuss bucking decisions to maximize value of each log. Discuss and practice log grading (Gazo, guest speaker). **1 Day**

<b>October 14, 2021</b>	<b>Grade-Sawing Hardwood Logs</b>	<b>Akron</b>
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Theory and practice of sawing hardwood logs into lumber. Observe external characteristics affecting lumber quality and measurement of selected logs. Discuss decisions made at head saw, resaw, edger and trimmer that affect the lumber grade. Cut logs on portable sawmill to observe the process in practice and evaluate the impact of right/wrong decisions (Gazo). **1 Day**

<b>Nov. 10, 2021</b>	<b>Saw Filing and Maintenance</b>	<b>Southern Ind.</b>
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Discuss proper care and maintenance of sawmill processing equipment. Circular and band mills will be included (Gazo, guest speaker). **1 Day**

<b>January 27, 2022</b>	<b>Sawmill Efficiency and Quality Control</b>	<b>Purdue</b>
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Discuss current and state-of-the-art sawmilling technology, including tree and log scanning, automated lumber grading, lumber overrun and recovery, statistical quality control, lean manufacturing principles and other modern management techniques (Gazo, guest speaker). **1 Day**

<b>February 23, 2022</b>	<b>Air Drying Hardwood Lumber</b>	<b>Logansport</b>
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Discuss moisture content of wood, why drying is necessary, various ways in which to dry lumber. Review principles of setting up a quality air-drying yard, proper lumber stacking and basics of wood preservation (Gazo). **1 Day**

<b>March 30, 2022</b>	<b>Kiln Drying Hardwood Lumber</b>	<b>Edinburgh</b>
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Discuss various methods and types of dry kilns, their pros and cons. Learn to develop a kiln-drying schedule and a way to select and check kiln samples. Discuss lumber drying defects and how to prevent them (Gazo). **1 Day**

## Secondary Industry Curriculum

<b>April 27-29, 2021</b>	<b>Hardwood 101 Industry Tour</b>	<b>Indiana</b>
Visit a tree farm, logging job, sawmill, veneer mill, drying yard, and furniture or cabinet manufacturer. Discuss industry processes, challenges and opportunities with principal owners or managers. Gain understanding of industry vocabulary, supply chain and connection to upstream and downstream processes (Gazo). <b>3 Day Tour</b>		
<b>May 12, 2021</b>	<b>Wood Science 101</b>	<b>Purdue</b>
Basic overview of wood as a manufacturing material. Discuss properties of wood related to manufacturing, and learn basics of wood identification. Includes an overview of wood based engineered materials used in furniture and other wood products (Gazo, Haviarova). <b>1 Day</b>		
<b>August 27, 2021</b>	<b>Shrinking and Swelling of Wood</b>	<b>Indy(Hrdwd Festival)</b>
Discuss moisture content of wood, its measurement and effect on wood products. Review furniture and cabinet design principles to minimize the effect of wood movement on product quality (Gazo, Haviarova). <b>1 Day</b>		
<b>September 15, 2021</b>	<b>Rough Mill Operation</b>	<b>Jasper</b>
Discuss manufacturing of dimension parts. Crosscut –first and rip-first rough mill processes, equipment, automation and optimization. Effect of lumber grades and cutting orders on yield (Gazo). <b>1 Day</b>		
<b>October 20, 2021</b>	<b>Wood Gluing</b>	<b>Logansport</b>
Discuss types of wood glues, presses and clamps. Review principles for achieving a strong and reliable glue joints. Discuss panel glue-up, finger jointing and panel veneer laminating. (Gazo). <b>1 Day</b>		
<b>November 17, 2021</b>	<b>CNC Manufacturing</b>	<b>Dale</b>
Discuss principle of operation, selection and operation of CNC equipment. Focus on part hold down, tooling and tool path programming. Overview of Computer Aided Design, Computer Aided Manufacturing and Computer Integrated Manufacturing (Gazo). <b>1 Day</b>		
<b>January 25, 2022</b>	<b>Common Wood Processing Equipment</b>	<b>Purdue</b>
Discuss basic wood processing equipment and sequence of operations from rough kiln dried lumber to furniture blanks and final machined parts. Will include facers, jointers, planers, crosscut and rip saws, moulders, tenoners, band saws, routers, shapers, boring machines and lathes (Gazo). <b>1 Day</b>		
<b>February 23, 2022</b>	<b>Furniture Strength Design &amp; Performance Testing</b>	<b>Purdue</b>
Discuss basic concepts of furniture strength design. Get familiar with furniture and cabinet performance standards, codes, types of tests, theory and practices. Use actual testing machine to perform an accelerated test (Haviarova). <b>1 Day</b>		
<b>March 30, 2022</b>	<b>Sustainable Wood Products Development</b>	<b>Jasper</b>
Discuss many positive attributes of wood as a natural construction material. Overview of Life Cycle Analysis and cradle to grave carbon accounting and end-of-life recycling of wood products (Haviarova). <b>1 Day</b>		

## **Training a-la-carte (you pick the topic and time and we will come to you)**

### **Automated Hardwood Lumber Grading 1/2 day**

Discuss state-of-the-art proven and existing technology for scanning rough, kiln dried lumber and computer grading it to NHLA lumber grading rules. Include edging and trimming optimization (Gazo).

### **Scanning of Hardwood Logs 1/2 day**

Discuss state-of-the-art proven and existing technology for scanning hardwood trees and logs with CT scanner. Discuss processing optimization for sawmills and veneer mills (Gazo).

### **Safety in the Wood Shop Training 1 day**

Discuss general safety in the wood shop and safety procedures for individual woodworking equipment such as table saw, band saw, jointer, planer, CNC equipment, etc. Practice hands on safety under supervision of experienced wood shop teacher (Haviarova, Bollock).

### **Sale and Marketing of Wood Products 1/2 day**

Discuss strategic importance of marketing and innovative sale practices suitable for forest products industry. Learn basics of putting together strategic marketing plan (Haviarova, guest speaker).

### **Supply Chain Management 1/2 day**

Overview and importance of forest products supply chain management. Discuss demand management, supply chain flow, inventory management coordination, cooperation, collaboration, and information sharing (Haviarova, guest speaker).

### **Lean Manufacturing 1/2 day**

Discuss main principles of lean manufacturing applicable to forest product industry. Highlight state of the art manufacturing operations around the world (Haviarova, guest speaker).

### **Wood Products and International Trade 1/2 day**

Overview of import and export statistics, opportunities and challenges of international trade. Overview of trade organizations that could help facilitate international trade (Haviarova, guest speaker).

### **School Furniture Production 1/2 day**

Discuss strength design principles for construction of durable and strong wooden chairs and desks suitable for developed and developing world. Hands on workshop where participants learn how to build chairs from wood residue material. This is an opportunity for supplemental production when business slows down (Haviarova, guest speaker).

### **Magical Wood 1 day**

Hands on workshop engaging youth in interactive games, with the goal to increase their interest in wood, the future sustainable material and expose them to careers in wood products industry (Haviarova, Gazo, Bollock).

### **Hands on Wood ID 1 day**

Learn how to identify commercially important hardwood species. Distinguish ring porous, semi-ring porous and diffuse porous species. Learn about macroscopic and microscopic features and how to use tools and keys for easy wood identification (Haviarova, guest speaker).

# Hardwood University Sign Up Form

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_

Class(s) attending: \_\_\_\_\_

Name of attendees: \_\_\_\_\_

(up to 4 if one-pay pass)

Tax-deductible payments can be made to IHLA.

\_\_\_\_\_ Sign me up for the Hardwood University One-Pay option.

\_\_\_\_\_ Check enclosed.

Please charge this card: \_\_\_\_\_

Name on card: \_\_\_\_\_ Exp. \_\_\_\_\_ CVV: \_\_\_\_\_

For specific class information please contact Rado Gazo, Purdue University at gazo@purdue.edu or 765.494.3634. Other questions call 317-288-0008.

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