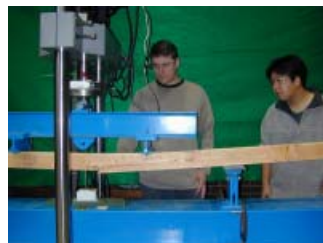


UNDERGRADUATE PROGRAMS

WOOD SCIENCE & TECHNOLOGY



OREGON STATE UNIVERSITY
WOOD SCIENCE & ENGINEERING



Wood Science & Technology at Oregon State University!

PREFACE

Oregon State University has one of the largest, comprehensive Wood Science & Technology programs in North America with over 50 years of experience in educating professionals for challenging careers. Our curriculum is designed to provide students with a formula for life long learning and is accredited by The Society of Wood Science and Technology. Our internationally-recognized faculty are committed to excellence in education. Our graduates are trained to help meet the future needs of society for wood products in ways that are sustainable, and environmentally sound. This booklet is for prospective students and current undergraduates interested in the Wood Science & Technology major or a Minor in Forest Products.

If you have questions, or want further information please call George Swanson, our program coordinator at 541-737-4206, Dr. Charles Brunner, our Head Academic Advisor at 737-4205, or send us an e-mail at woodscience@oregonstate.edu.

Thomas E. McLain
Professor and Department Head





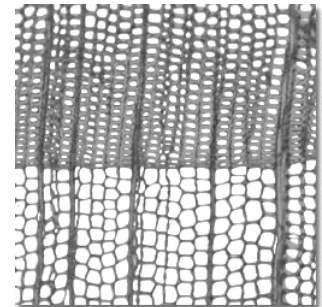
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WHAT IS WOOD SCIENCE AND TECHNOLOGY?

Wood Science and Technology (WS&T) deals with one of the most complex, renewable and useful natural materials in the world—wood. The field is a blend of the sciences involving the physical, chemical and mechanical properties of wood, the technology used to convert wood into thousands of different useful products, and the business that uses science and technology to successfully meet the growing demands of society for wood products.



Wood Science and Technology is an interdisciplinary field and WS&T professionals use knowledge from fields of chemistry, physics, math, biology, engineering science and business.

Why is WS&T Important?

The worldwide demand for wood products is increasing with growing population and increased standards of living. In 2002, each American “consumed” about 70 cubic ft of wood products in many forms. That means that each of the 270 million citizens uses the equivalent of a 100 foot tree 18 inches in diameter every year. **The challenge of wood science and technology is to find ways to sustainably meet the growing demand for wood while maintaining a high level of environmental quality.**

Given the diversity in the ways we use wood, it is no surprise that the career opportunities for wood technologists and scientists are just as numerous. Nationwide the wood products industry employs over 2,000,000 people in almost 100,000 manufacturing plants and related business facilities. In Oregon the forest products industry employs over 50,000 people and is a major contributor to the state economy.

What are the Career Opportunities in WS&T?

In general, there are four broad areas in which graduates with a BS in Wood Science and Technology find employment: manufacturing, marketing, technical service and research.

Careers in **Manufacturing** are especially diverse and deal with product and process development, quality control, production and management. Entry level-positions are typically in production and management. **Marketing** is a key element in forest products business strategy and deals with many activities connected with the flow and exchange of ideas, goods and services from initial concept to consumer use. Entry- level positions are often in sales, advertising, and management. **Technical service** representatives work for suppliers, industry associations or manufacturers and use their knowledge of wood and the industry to enhance the efficiency or profitability of clients, or to provide technical advice and input to industry or consumer problems. University Extension programs are another source of employment. **Research** scientists use imagination, inquisitiveness and insight in discovering new facets to nature’s most complex natural composite material, or to solve problems. Research areas are many, especially with material development and behavior, or process improvement. Research careers often require graduate degrees.

Some examples of recent jobs taken by OSU graduates:

- Clear Pine Moulding Quality Control
- Jeld Wen Production Management Trainee
- OSU Graduate Research Assistant
- Timber Products Production Management Trainee
- Trus-Joist Quality Control
- Dynea USA Technical Service
- Western Wood Products Association Technical Support, Marketing
- Weyerhaeuser Quality Control
- Endura Wood Products Sales/Marketing
- Georgia Pacific Product Manager/Sales
- Dynea USA Research



“Career opportunities in wood science and technology are incredibly diverse and really challenging” says 1999 OSU graduate Tyler Congleton.

- o OSU graduates in government service are employed by the US Forest Service, US Dept of Energy, Federal Aviation Authority, State of Oregon, State of Washington, and others.
- o OSU graduates are currently faculty at Universities such as Virginia Tech, Louisiana State, Mississippi State, Stephen F. Austin, Maine, North Carolina State and others.
- o Private sector employers range from large integrated forest products firms such as Weyerhaeuser, Boise Cascade, and Jeld Wen to suppliers such as Dynea Adhesives, Chemical Specialities, Inc, industry associations such as Western Wood Products Assn. and many others.



Other Current Job Titles of OSU Graduates:

Plant Engineer
 Design Engineer
 Project Engineer
 Wood Chemist
 Production Foreman
 Technical Support Writer
 Technical Director
 International Lumber Trader
 Wood Products Pathologist
 Trade Association Representative
 Management Trainee
 Wood Technologist
 Quality Control Technician
 Marketing Manager

Research General Engineer
 Wood Products Technologist
 Quality Control Supervisor
 Technical Service Manager
 Research Technologist
 Editor, Trade Journal
 Product Development Specialist
 Account Representative
 Software Analyst
 Extension Agent
 Total Quality Trainee
 Research Scientist
 Sales Manager
 Products Manager

Starting salaries for recent WS&T graduates have averaged between \$35,000 and \$40,000 annually, and 100% of WS&T students seeking employment in the last decade have been successful.

WS&T professionals enjoy very diverse careers that can take them to mills, laboratories, high-tech manufacturing plants, corporate boardrooms, or foreign countries. Jobs are found in rural and urban areas, small towns and large cities. Specialists can work solving challenging technical problems, developing and marketing new products, improving sales, exploring ways to

meet increasing demand, or providing leadership to business or regulatory concerns. A common theme is wood – how to conserve it, use it more effectively and improve the value of the renewable resources we make available for society’s needs. With the significant change in the North American industry over the past decade, the demand for trained wood scientists and technologists exceeds the supply.





WHY STUDY WOOD SCIENCE & TECHNOLOGY AT OSU?

Faculty: The Department of Wood Science & Engineering at Oregon State University has one of the largest, most comprehensive faculty in North America. Many faculty are leaders in their field and are internationally recognized. Most WS&E faculty teach classes and advise students. With an average class size under twenty, faculty provide more personal attention to student learning and professional development than in majors with larger numbers of students.



Industrial Collaboration: Most types of wood products processing plants or manufacturing facilities are located within easy driving distance from Corvallis. As a result, many labs are conducted in the field or at industrial facilities. We enjoy good working relations with the extensive Oregon forest products industry which translates into summer and permanent employment opportunities, and access to industrial equipment for teaching and learning.

Flexible Curriculum: Six different options are available to WS&T majors as described later. Built-in flexibility enables transfer students to join the WS&T program with minimal loss of credit. Some options give students great flexibility to tailor their curriculum to their interests. All have free electives in addition to their Baccalaureate Core selections.



Facilities: All WS&T courses are taught in Peavy and Richardson Hall on the OSU campus. Richardson Hall is a new state-of-the-art teaching and research facility, with over 98,000 square feet of space and has extensive labs including a Wood Science Teaching Lab, Distance Education Classroom, Structural Testing, Computer-aided Manufacturing, and Wood Processing Labs. This new facility is conveniently located next to Peavy Hall, the main College of Forestry building, with a connecting walkway, that places most of your class and laboratory needs in one location.

Scholarships: All WS&T students are eligible to compete for over \$200,000 in scholarships given in the College of Forestry each year. In addition, many WS&T students are eligible for departmental scholarships (\$1500-\$3000/year), and other smaller awards restricted to only WS&T students.

Senior Project: As part of the curriculum, seniors complete a capstone project that provides an opportunity to use the knowledge they have acquired at Oregon State University to solve real-world industry problems. Senior projects are designed to give you critically needed communication, problem solving and organization skills that will serve you for the rest of your life. Many projects are sponsored by an industry partner.

Work Experience: Each graduate of our program spends at least six months working in the industry, usually during summer terms. This work provides good pay for the coming year's expenses, as well as making you a more marketable professional graduate.



ADMISSION REQUIREMENTS

You must satisfy Oregon State University requirements for entrance as listed in the General Catalog. A copy of the General Catalog and application forms for admission can be obtained from the Office of Admissions, Oregon State University, Administrative Services B104, Corvallis, Oregon 97331-2106. Telephone: (541) 737-4411. Admission information is available on the Internet at <http://www.oregonstate.edu>.

Freshmen and transfer students should prepare by taking a well-balanced college preparatory curriculum in high school. Advanced courses in biology, chemistry, and math are recommended. Transfer students are encouraged to have taken math and science courses that will prepare them for a technical curriculum.

All students are encouraged to take classes in the humanities, a foreign language, and communications to develop writing and public speaking skills.

Richardson Hall, dedicated in 1999 is a new state-of-the-art teaching and research facility, with over 98,000 square feet of space. Richardson Hall is conveniently located next to Peavy Hall which houses most College of Forestry classrooms.



WHAT WILL YOU LEARN?

The Wood Science and Technology program provides a broad-based education. Our goal is to prepare you to be a successful professional in a field that requires understanding basic sciences and business, wood as a material, how it is processed and how it is used. We emphasize effective communication and leadership skills necessary for a successful professional career. Your training will make you highly adaptable, an important consideration in an ever-changing business environment. While we focus on wood-related careers, our curriculum can be the foundation for other successful career paths.

The curriculum is rigorous and prepares you to deal with the technical, social, and political aspects of the field. Successful completion of the program provides competence in basic wood science, forest biology, management sciences, decision making, problem solving, social sciences, and communications.

Work Experience: To earn a WS&T degree, you must fulfill a requirement for six months of satisfactory work experience. Usually this happens during the summer months. This experience will broaden your horizons, reinforce course work, improve your work habits, teach you valuable life and interpersonal skills, and enhance your employability. Salaries for graduates with relevant work experience are typically higher than for others and temporary employment may lead to a permanent position with the same employer. Department faculty will typically help you find appropriate summer employment and are happy to assist with your search for permanent employment after graduation.

Extracurricular activities in student organizations (Forest Products Society, Forest Recreation Club, Society of American Foresters Student Chapter, Xi Sigma Pi [honorary], Forestry Club, and Natural Resources Club) is an important facet of our program. Students find these activities enhance their understanding of forest resources, give new meaning to their course work, and provide opportunities to develop leadership and communication skills that enhance their employability and professional development.



WOOD SCIENCE AND TECHNOLOGY CURRICULUM

The WS&T curriculum is designed to be completed in four years (twelve quarters). To do so, you must average sixteen credits per term and be diligent about scheduling prerequisite courses and course sequences. Your faculty advisor will make suggestions and give advice regarding scheduling, but the final decision is yours. Students may also earn concurrent Bachelor's degrees in science, engineering, or business by taking additional time to complete the requirements.

Qualifying for Graduation

To be qualified to receive a BS in Wood Science and Technology you must successfully meet all of the Department, College and University requirements. These are:

- o successfully complete course requirements of the University Baccalaureate Core, the WS&T core curriculum and one of the transcript-visible WS&T options. [Note: all courses listed by course number in the WS&T core and options must be graded; S/U grading is not accepted.]
- o complete six months of work experience approved by the WS&T Lead Advisor,
- o complete a minimum of 192 quarter credit hours, including 60 credits of 300/400 level courses,
- o achieve a minimum grade point average of 2.00 for all work
- o complete a residency requirement by earning the last 45 credit hours at Oregon State University, or 45 of the last 60 hours with the approval of the Dean of the College of Forestry.
- o achieve senior standing, and make formal application for the degree with the University Registrar two terms prior to the term that you expect to finish your degree requirements.



CORE REQUIREMENTS

University Baccalaureate Core courses not satisfied by the WS&T Core or an Option (27 credits)

Writing I: WR 121 (3) English Composition
 Writing II: Requires WR 214 (3) Writing in Business
 ~OR~ WR 327 (3) Technical Writing
 Writing III: Requires COMM 111 Public Speaking
 ~OR~ COMM 114 (3) Argument & Critical
 Discourse
 Fitness: HHS 231 (2) Lifetime Fitness for Health and
 HHS 241-251 (1) Lifetime Fitness (various
 activities)
 Perspective Courses:
 Cultural Diversity Elective (3)
 Difference, Power, & Discrimination Elective (3)
 Literature & Arts Elective (3)
 Western Culture Elective (3)
 Synthesis:
 Global Issues Elective (3)

Wood Science and Technology Core (61 credits)

ECON 202 (4) Introduction to Macroeconomics
 FOR 111 (3) Introduction to Forestry
 FOR 112 (3) Introduction to Computer Applications
 in Forestry
 FOR 141 (3) Tree & Shrub Identification
 FOR 240 (4) Forest Biology
 WSE 201 (1) Intro. to Wood Science & Tech.
 WSE 210 (4) Wood Technology & Utilization
 WSE 211 (1) Wood Properties & Measurements
 Lab
 WSE 312 (4) Wood & Fiber Anatomy
 WSE 314 (4) Wood & Fiber Physics
 WSE 316 (3) Wood & Fiber Chemistry
 WSE 318 (4) Mechanical Behavior of Wood
 WSE 407 (1) Senior Seminar
 WSE 411 (2), 412 (2), 413 (2) Forest Products
 Projects
 WSE 440 (3) Wood Drying & Preservation
 WSE 441 (4) Primary Wood Processing
 WSE 442 (4) Composites Manufacturing
 WSE 445 (3) Chemical Wood Processes &
 Pollution Control
 WSE 460 (3) Wood as a Resource for Housing



OPTIONS

All Students must Select One of the Following

- Bio-based Composites Manufacturing (BCM) Option^{1 & 4}**
- Forest Products Marketing (FPM) Option^{3 & 4}**
- Wood Engineering & Science (WES) Option²**
- Wood Industry Environmental, Health and Safety (EHS) Option^{1 & 4}**
- Wood Industry Management (WIM) Option³**
- Wood Industry Production Planning & Quality Control (WIPP) Option^{1 & 4}**

1. Recitation for physics PH 221, 222 (1,1) is not required for these options, but is strongly recommended.
2. Students enrolled in the WES option may satisfy the area of concentration requirement either by completing an approved minor in another field or an integrated program of study developed by the student and his/her advisor.
3. Completion of the FPM or WIM option with a GPA of 2.5 fulfills the requirements for a transcript-visible Business Administration Minor. Students with this minor may apply for enrollment into the 58-credit hour, four-term, College of Business MBA degree program.
4. All students must complete a Senior Project (WSE 411, 412, 413) using a topic that integrates the knowledge and skills developed in their option's area of specialization.



Wood Industry Management Option (104 credits)

- BA 211 (4) Financial Accounting
- BA 213 (4) Managerial Accounting
- BA 230 (4) Business Law
- BA 275 (4) Quantitative Business Methods
- BA 340 (4) Finance
- BA 350 (4) Organizational Systems ~OR~
- BA 352 (4) Organizational Behavior
- BA 357 (4) Operations Management
- BA 390 (4) Marketing
- CH 121, 122, 123 (5,5,5) General Chemistry
- ECON 201 (4) Introduction to Microeconomics
- MTH 111 (4) College Algebra
- MTH 112 (4) Elementary Functions
- MTH 241 (4) Calculus for Management & Social Science
- MTH 245 (4) Mathematics for Management, Life, & Social Sciences
- PH 201, 202 (5,5) General Physics
- WSE 446 (3) Secondary Wood-Products Processing
- WSE 452 (4) Process Control in the Forest Products Industry
- WSE 455 (3) Forest Products Marketing
- Student Selected Electives (16)

Forest Products Marketing Option (104 credits)

- BA 211 (4) Financial Accounting
- BA 213 (4) Managerial Accounting
- BA 230 (4) Business Law
- BA 275 (4) Quantitative Business Methods
- BA 340 (4) Finance
- BA 347 (4) International Business
- BA 350 (4) Organizational Systems ~OR~
- BA 352 (4) Organizational Behavior
- BA 357 (4) Operations Management
- BA 390 (4) Marketing
- BA 494 (4) Marketing Channels
- BA 496 (4) Marketing Research
- BA 497 (4) Global Marketing
- CH 121, 122, 123 (5,5,5) General Chemistry
- ECON 201 (4) Introduction to Microeconomics
- MTH 111 (4) College Algebra
- MTH 112 (4) Elementary Functions
- MTH 241 (4) Calculus for Management & Social Science
- MTH 245 (4) Mathematics for Management, Life & Social Sciences
- PH 201, 202 (5,5) General Physics
- WSE 446 (3) Secondary Wood-Products Processing
- WSE 455 (3) Forest Products Marketing
- Student Selected Electives (4)



**Bio-based Composites
Manufacturing Option
(104 credits)**

CH 221, 222, 223 (5,5,5) General Chemistry
 CH 334, 335 (3,3) Organic Chemistry
 ENGR 211 (3) Statics
 ENGR 212 (3) Dynamics
 ENGR 213 (3) Strength of Materials
 ENGR 311 (3) Thermodynamics
 ENGR 312 (4) Thermodynamics: Applications
 ENGR 321 (3) Material Science
 ENGR 322 (4) Mechanical Properties of Materials
 ENGR 331, 332, 333 (4,4,3) Momentum, Energy, &
 Mass Transfer
 ENGR 390 (3) Engineering Economy
 MTH 251 (4) Differential Calculus
 MTH 252 (4) Integral Calculus
 MTH 254 (4) Vector Calculus
 MTH 256 (4) Applied Differential Equations
 ME 316 (3) Mechanics of Materials
 ME 480 (3) Materials Selection
 PH 203 (5) General Physics
 PH 211, 212 (4,4) General Physics with Calculus
 ST 314 (3) Introduction to Statistics for Engineers
 WSE 452 (4) Process Control in the Forest Products
 Industry
 Student Selected Electives (3)

**Wood Engineering & Science Option
(104 credits)**

CH 130 (4) General Chemistry of Living Systems &
 CH 201, 202 (3,3) Chemistry for Engineering
 Majors ~OR~ CH 221, 222, 223 (5,5,5) General
 Chemistry
 ECON 201(4) Introduction to Microeconomics
 MTH 111(4) College Algebra
 MTH 112 (4) Elementary Functions
 MTH 251 (4) Differential Calculus
 MTH 252 (4) Integral Calculus
 MTH 254 (4) Vector Calculus
 PH 203 (5) General Physics
 PH 211, 212 (4,4) General Physics with Calculus
 PH 221, 222 (1,1) Recitation for Physics 211, 212
 ST 351, 352 (4,4) Introduction to Statistical
 Methods
 WSE 446 (3) Secondary Wood-Products Processing
 WSE 452 (4) Process Control in the Forest Products
 Industry
 Approved Area of Concentration (minimum of 27
 credits including 12 upper-division credits)
 Student Selected Electives (7-12)

**Wood Industry Environmental, Health,
and Safety Option
(104 credits)**

CH 221, 222, 223 (5,5,5) General Chemistry
 CH 334, 335 (3,3) Organic Chemistry
 CHE 211 (3) Material Balances and Stoichiometry
 CHE 212 (4) Energy Balances
 CHE 311 (3) Thermodynamic Properties and
 Relationships
 ENGR 390 (3) Engineering Economy
 ENVE 321 (4) Environmental Engineering
 Fundamentals
 ENVE 421 (4) Water and Waste Water
 Characterization
 ENVE 425 (3) Air Pollution Control
 ENVE 431 (4) Fate & Transport of Chemicals in
 Environmental Systems
 H 385 (3) Safety and Health Standards and Laws
 H 445 (3) Occupational Health
 H 485 (3) Safety, Health and Environmental Law
 H 488 (3) Occupational Safety
 MTH 251 (4) Differential Calculus
 MTH 252 (4) Integral Calculus
 MTH 254 (4) Vector Calculus
 MTH 256 (4) Applied Differential Equations
 PH 203 (5) General Physics
 PH 211, 212 (4,4) General Physics with Calculus
 ST 314 (3) Introduction to Statistics for Engineers
 WSE 446 (3) Secondary Wood-Products Processing
 Student Selected Electives (7)

**Wood Industry Production
Planning & Quality Control Option
(104 credits)**

CH 121, 122, 123 (5,5,5) General Chemistry
 ENGR 248 (3) Engineering Graphics & 3-D Modeling
 ENGR 350 (3) Sustainable Engineering
 ENGR 390 (3) Engineering Economy
 IE 337 (4) Industrial Manufacturing Systems
 IE 355 (4) Quality & Applied Statistics I
 IE 356 (4) Experimental Design for Industrial
 Processes
 IE 366 (4) Work Design
 IE 367 (4) Production Planning & Control
 IE 368 (4) Facility Design & Operations
 Management
 IE 444 (3) Industrial Safety
 IE 450 (3) Total Quality Management
 IE 464 (3) Design & Scheduling of Cellular
 Manufacturing Systems
 MTH 251 (4) Differential Calculus
 MTH 252 (4) Integral Calculus
 MTH 254 (4) Vector Calculus
 PH 203 (5) General Physics
 PH 211, 212 (4,4) General Physics with Calculus
 ST 314 (3) Introduction to Statistics for Engineers
 WSE 446 (3) Secondary Wood-Products Processing
 WSE 452 (4) Process Control in the Forest
 Products Industry
 Student Selected Electives (11)



Wood Science and Technology Scholarships

Purpose

The Wood Science & Technology Scholarship is supported by the Richardson Family Endowment to enable men and women of diverse backgrounds to enter Wood Science & Technology professions through an OSU education, and to encourage sustained high scholastic achievement by WS&T students.

The awards are \$1500 annually for eligible transfer, first and second-year students and \$3000 annually for eligible juniors and seniors, payable in \$500 or \$1000 per term of eligibility. Currently, 10-12 awards are made annually, contingent on the availability of funds.



Award Information and Eligibility Criteria

1. Open to all undergraduate Wood Science & Technology majors.
2. Initial eligibility:

Incoming first-year students with a minimum 3.5 high school GPA or transfer students from community college or from another program on campus with a minimum 3.0 GPA for all college-level work, are eligible for first year support of \$1500 (\$500/term).
3. Continuing students at Junior and higher level may receive an award of \$3000 per year (\$1000/term).
4. First-year and Sophomore students must complete an average of 12 credits each term and Junior and Senior students must complete an average of 15 credits each term to remain eligible for the scholarship.
5. All awardees must continue to make adequate progress toward a degree in Wood Science & Technology as judged by the WS&T Lead Advisor.
6. Awardees must maintain a 3.0 cumulative GPA to remain eligible for the scholarship. Students who fail to meet this requirement and lose their eligibility may reapply to the Richardson Scholarship committee for reinstatement once their cumulative GPA is 3.0 or better.
7. Students may receive scholarships for up to twelve academic quarters (three terms per year). Awards may be initiated in any term and will normally continue through the academic year. Continuing students must reapply to the College of Forestry scholarship program at the end of spring term each year.
8. Students remain eligible for all other College of Forestry scholarships.
9. The number of awards made each year is contingent upon the availability of funds.

Application and Selection

Interested students must complete the College of Forestry Scholarship application and return it to the WS&T Program coordinator. Selection will be made by a sub-committee of the College Scholarship Committee who will review applications each term.



MINOR IN FOREST PRODUCTS

A minor in Forest Products is often used by Business Administration, Science or Engineering majors to add value to their degree and make them more marketable upon graduation. If you are interested in this minor, you should visit with Dr. Brunner who can advise you on scheduling and selecting the courses that best fit your interests and career goals. Students not majoring in WS&T may qualify for a transcript-visible minor in Forest Products by completing a total of 27 quarter credits with the following requirements:

Core Courses (9 credits)

WSE 210 (4) Wood Technology and Utilization
WSE 211 (1) Wood Properties & Measurements Lab
WSE 312 (4) Wood and Fiber Anatomy

Select from the following courses (18 credits min.)

FOR 111 (3) Introduction to Forestry
WSE 314 (4) Wood & Fiber Physics
WSE 316 (3) Wood & Fiber Chemistry
WSE 318 (4) Mechanical Behavior of Wood
WSE 407 (1) Forest Products Senior Seminar
WSE 440 (3) Wood Drying and Preservation
WSE 441 (4) Primary Wood Processing
WSE 442 (4) Composites Manufacturing
WSE 445 (3) Chem. Wood Processing and Pollution Control
WSE 446 (3) Secondary Wood Products Manufacturing
WSE 452 (4) Process Control in the Forest Products Industry
WSE 455 (3) Forest Products Marketing
WSE 458 (4) Wood Design





UNDERGRADUATE COURSES OFFERED

WSE 201. Introduction to Wood Science & Technology (1) Introduction to the breadth of disciplines and opportunities within the wood science and technology profession. Discussion of critical issues, available resources, career opportunities and professional requirements directed toward the new major or exploring student.

WSE 210. Wood Technology and Utilization (4) Characteristics and uses of wood and fiber products; manufacturing processes; effect of tree growth and harvesting on forest products manufacturing and properties; wood identification.

WSE 211. Wood Properties and Measurements Laboratory (1) Measurement of basic wood properties; measurement and grades of wood raw materials and products.

WSE 312. Wood and Fiber Anatomy (4) Minute anatomy and variability of wood species; natural characteristics and deterioration; density, cell wall properties, and wood and fiber surfaces. PREREQ: WSE 210.

WSE 314. Wood and Fiber Physics (4) Hygroscopic nature of the wood fiber and solid wood; wood-fluid relationships; steady-state flow processes; electrical, thermal, and sonic properties of wood and wood-based composite materials. PREREQ: PH 202; calculus.

WSE 316. Wood and Fiber Chemistry (3) Lignin, polysaccharides, and extractives of wood and bark; distribution, isolation, structure, and relationships with anatomy, properties, and uses. PREREQ: 1 year general chemistry.

WSE 318. Mechanical Behavior of Wood (4) Statics and strength of wood and wood-based composites;



WSE 401. Research (TBA).

WSE 405. Reading and Conference (TBA).

WSE 407. Senior Seminar (1) Professionalism, ethics and career challenges.

WSE 411, 412, 413. Forest Products Project I, II, III (2, 2, 2) A capstone course in which students plan, execute, and report a research-type project of their own choice related to the field of forest products. (Writing Intensive Course) WSE 411: Project selection and planning, culminating in a written work plan. PREREQ: WSE 312, WSE 314, WSE 316, WSE 318. WSE 412: Project is executed according to the work plan developed in WSE 411. PREREQ: WSE 411. WSE 413: Findings are analyzed and presented in a written report and an oral presentation. PREREQ: WSE 412.

WSE 440. Wood Drying and Preservation (3) Drying wood, including lumber, veneer, and particles. Moisture-related problems of wood during processing and in-service. Wood-destroying organisms. Extending the life of wood using preservatives. PREREQ and COREQ: WSE314. Lec/lab.

WSE 441. Primary Wood Processing (4) Mechanical breakdown of lumber, veneer and chips from a processing perspective; Mill/plant layout; quality and process control applications; Field trips. PREREQ: WSE 210.

WSE 442. Composites Manufacturing (4) Composites, wood adhesive and adhesion processes and plant layouts; laminated and panel products; coatings and overlays; quality control, recovery and grades. Field trips. PREREQ: WSE210.

WSE 445. Chemical Wood Processing and Pollution Control (3) A survey of the chemical processing of wood with emphasis on its environmental impact. Topics include treating of wood to resist decay, pulping and papermaking, and adhesives used in wood composites. PREREQ: WSE316. Lec/lab.

WSE 446. Secondary Wood-Products Manufacturing (3) Application of machining, assembling, and finishing techniques to wood-based products to increase their value; the use of computers for design and process planning; environmental considerations in secondary processing. PREREQ: WSE210.



WSE 452. Process Control in the Forest Products Industry (4) Use of sensing devices, analysis methods, and hardware to control variables found in typical wood products processes. PREREQ: WSE 314, WSE 441, WSE 442 or WSE443, ST 351 or BA 275.

WSE 455. Forest Products Marketing (3) Marketing and its application in the forest products industry. PREREQ: BA 390.

WSE 458. Wood Design (4) Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glue laminated members. Analysis and design of structural diaphragms and shear walls. PREREQ: CE 381 and CE 382.

WSE 470. Wood and Civilization. (3) Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies.

Course No.	Credits	Fall Term	Winter Term	Spring Term
WSE 201	1	X		
WSE 210	4		X	
WSE 211	1		X	
WSE 312	4			X
WSE 314	4		X	
WSE 316	3	X		
WSE 318	4			X
WSE 407	1		X	
WSE 411	2	X		
WSE 412	2		X	
WSE 413	2			X
WSE 440	3		X	
WSE 441	4			X
WSE 442	4	X		
WSE 445	3	X		
WSE 446	3		X	
WSE 452	4		X	
WSE 455	3	X		
WSE 458	4			X
WSE 470	3			X



WOOD SCIENCE AND ENGINEERING FACULTY

Terence D. Brown

Professor and Extension Specialist, Ph.D., Colorado State University, Extension education in primary processing efficiencies: quality control; total quality management (TQM); secondary manufacturing.

Charles C. Brunner

Associate Professor, Ph.D., Virginia Tech., Wood Processing, operations research.

James W. Funk

Associate Professor, Ph.D., Iowa State University, Wood technology; process analysis; process control; quality control; process modeling; scanning.

Barbara L. Gartner

Associate Professor, Ph.D., Stanford University, Wood anatomy, wood quality, stem physiology, ecology.

Rakesh Gupta

Associate Professor, Ph.D., Cornell University, Wood engineering/mechanics; mechanical properties of wood.

Eric N. Hansen

Associate Professor and Extension Specialist; Ph.D., Virginia Tech., Forest products marketing; customer perceived quality; environmental marketing; certification; use and perceptions of engineered wood products.

Frederick Kamke

Professor and JELD-WEN Chair of Wood-based Composites Science, Ph.D., Oregon State University, Heat and mass transfer in wood and wood-based products, with emphasis on adhesion science, modeling, and the manufacture and performance of wood-based composite materials.

Joseph J. Karchesy

Associate Professor, Ph.D., Oregon State University, Molecular structure and chemistry of natural products from wood, bark, and forest plants; wood chemistry; new medicines and insecticides from forest products; non-timber forest products.

Scott A. Leavengood

Associate Professor/Washington County Extension Agent, MS, Oregon State University, Extension education in wood technology; quality and process control; utilization on nontraditional species (e.g., western juniper and hybrid poplar).

Stephen J. Lawton

Associate Professor of International Business, M.B.A. Cornell University, Effective management of international strategic alliances, globalization of the forest products industry, marketing of certified forest products.

Kaichang Li

Associate Professor, Ph.D., Virginia Tech., Biodegradation of lignin; enzymatic pulp bleaching; wood adhesives; wood composites.

Thomas E. McLain

Professor and Department Head, Ph.D., Colorado State University, Mechanical properties of wood and wood-based products; structural mechanical connections; new technology and methods for structural design.

Thomas H. Miller, P.E.

Associate Professor of Civil Engineering, Ph.D., Cornell University, Structural engineering and structural mechanics; earthquake engineering; timber design; steel structures.

Michael R. Milota

University Distinguished Professor, Ph.D., Oregon State University, Wood drying and physical properties.

Jeffrey J. Morrell

Professor Ph.D., SUNY College of Environmental Science and Forestry, Biodeterioration and wood preservation. Pathology

John A. Nairn

Professor Ph.D., University of Utah, Composites, nanocomposites, effect of residual thermal stresses in composites; durability of composites including physical aging, hygrothermal aging, and fatigue; fracture analysis of polymers including ductile failures & thermal effects in fracture.

John W. Punches

Associate Professor and Extension Agent, M.S. Virginia Polytechnic Institute, Extension education and applied research in a broad array of forestry and wood products areas. Specific emphasis in wood quality and application of internet technologies for wood products marketing.

James E. Reeb

Associate Professor and Extension Specialist, Ph.D., Texas A&M, Wood processing, operations research education and applied research in a broad array of forestry and wood products areas. Specific emphasis in wood quality and application of internet technologies for wood products marketing.

W. John Simonsen

Associate Professor, Ph.D., University of Colorado, Wood preservation; wood/polymer composites; recycling/residue utilization; pulp extrusion; cellulose and lignin films; adhesion.



Notes

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