

Wood Science and Technology, B.S.

Degree Offered

- Bachelor of Science

Nature of the Program

Accredited by the Society of Wood Science and Technology (SWST), the Wood Science and Technology curriculum prepares students in key skill sets using hands-on cutting-edge technology, innovation in new product development, marketing, and manufacturing to directly work in an ever-growing the U.S. forest products industry (biorefining, renewable materials, and sustainable construction). According to the American Forest and Paper Association (AF&PA), the U.S. forest products industry is one of the top ten manufacturing sector employers, which employs about one million workers and accounts for approximately six percent of the total U.S. manufacturing GDP. Some examples of products include: energy efficient green building construction materials, lignocellulosic materials for packaging, pharmaceutical and catalysis applications, highly advanced carbon materials for adsorption and electrochemical applications, energy and fuels applications from lignocellulosic materials, green fibers for textile and paper applications, and sporting goods. One of the most sensible alternatives to reduce global warming is the use of wood as a raw material in manufacturing of various products, which enables an environmentally friendly method to store atmospheric carbon in various wood products for prolonged periods. The Wood Science and Technology curriculum is highly focused on these aspects of the forest products industry.

Professional Areas of Emphasis

Students may choose a specialized professional area of emphasis in:

- Processing
- Utilization
- Renewable Materials Marketing
- Sustainable Low-Rise Residential Construction

PROCESSING AREA OF EMPHASIS

The Area of Emphasis in Processing provides flexibility within the context of a fundamental wood science and renewable materials-based curriculum by requiring that students complete a minor plus specialized wood processing courses and restricted electives. Students transferring into wood science and technology from a related discipline may use the previous major instead of a minor as the area of emphasis provided the student has passed at least fifteen semester hours of core coursework from the previous discipline as indicated by a common course prefix (i.e., FMAN) with a C grade or better and has received approval from the wood science and technology faculty. Potential careers include, but are not limited to production of wood products and other renewable plant-based materials (including residential construction materials and components, furniture and cabinets, and engineered wood products); marketing of building and related products; and research.

UTILIZATION AREA OF EMPHASIS

The Area of Emphasis in Utilization consists of forestry, wood science, restricted electives, and related courses. The Utilization area of professional emphasis prepares graduates for careers in timber harvesting, forest engineering, primary processing of wood products, and timber procurement.

RENEWABLE MATERIALS MARKETING

The Renewable Materials Marketing Area of Emphasis prepares students for a career in marketing wood and other renewable materials and products. Specific careers may include retail and wholesale marketing, sales, purchasing, or distribution of products.

SUSTAINABLE LOW-RISE RESIDENTIAL CONSTRUCTION AREA OF EMPHASIS

The Sustainable Low-Rise Residential Construction Area of Emphasis prepares students for careers in management, supervision, and specifying of materials for single family and multi-family, low-rise residential (i.e. town houses and 2-3 story apartment buildings) construction.

Special Opportunities

A regional center for development of the wood products industry, the Appalachian Hardwood Center, is allied with the Wood Science and Technology Program. The center's staff frequently provides opportunities for educational and professional development of wood science and technology students. Students sometimes find part-time employment in the research program of the center as well as with the faculty's teaching and research program.

Career Opportunities

The U.S. forest products industry employs about one million workers. West Virginia University is one of the nine American universities, which provide accredited programs specifically designed to educate professionals to manage and provide technical expertise to the industry. The unique manufacturing sector focus of the program and the large base of potential employers result in an excellent job market for wood science and technology graduates. Career opportunities are quite diverse. The jobs span the spectrum from standing timber through manufacture of products to their marketing,

distribution, and end use. Graduates may work in sawmills as production managers or as timber procurement foresters, buying timber and planning harvesting operations in accordance with sound forest management and environmental practices. They may also gain employment as quality assurance managers, production supervisors, and process engineers for companies that manufacture furniture, cabinets, state-of-the-art engineered wood products, renewable construction and bioproducts. Graduates may become product designers and estimators, purchasers and sellers of materials and services, or supervisors and managers of residential construction projects. Some of our graduates go on to graduate school in wood science or related disciplines, including forestry, business administration, and engineering. They work in all parts of the nation and in both rural and urban communities, yet approximately half find employment in West Virginia. Many of the leaders in the nation's wood products industry are WVU graduates.

Admissions

- First-Time Freshmen are admitted directly into the Wood Science & Technology major.
- Students transferring from another major at WVU are directly admitted to the Wood Science & Technology major if they are in good academic standing (2.00 overall GPA).
- Students transferring from another institution are directly admitted to the Wood Science & Technology major if they are in good academic standing (2.00 overall GPA).

Due to Covid-19 – Admission requirements may differ from what is listed on this page. Please review the most up-to-date program admission requirements for the Bachelor of Science in Wood Science major.

ADMISSION REQUIREMENTS 2022-2023

The Admission Requirements above will be the same for the 2022-2023 Academic Year.

Major Code: 0774

General Education Foundations

Please use this link to view a list of courses that meet each GEF requirement. (<http://registrar.wvu.edu/gef/>)

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

General Education Foundations

F1 - Composition & Rhetoric		3-6
ENGL 101 & ENGL 102 or ENGL 103	Introduction to Composition and Rhetoric and Composition, Rhetoric, and Research Accelerated Academic Writing	
F2A/F2B - Science & Technology		4-6
F3 - Math & Quantitative Reasoning		3-4
F4 - Society & Connections		3
F5 - Human Inquiry & the Past		3
F6 - The Arts & Creativity		3
F7 - Global Studies & Diversity		3
F8 - Focus (may be satisfied by completion of a minor, double major, or dual degree)		9
Total Hours		31-37

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

CURRICULUM REQUIREMENTS

Students seeking the B.S. in Wood Science and Technology must select from one of four Areas of Emphasis.

University Requirements	7
Wood Science and Technology Major Requirements	113
Total Hours	120

University Requirements

General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)

Outstanding GEF Requirements 6 and 7	6
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ANRD 191	First-Year Seminar	1
Total Hours		7

Wood Science and Technology Major Requirements

Select one of the following (GEF 1):		6
ENGL 101 & ENGL 102 or ENGL 103	Introduction to Composition and Rhetoric and Composition, Rhetoric, and Research Accelerated Academic Writing	
BIOL 101 & BIOL 103	General Biology and General Biology Laboratory (GEF 2)	4
Select one of the following (fulfills Writing and Communication Skills requirement):		3
ENGL 304	Business and Professional Writing	
ENGL 305	Technical Writing	
Select one of the following (GEF 8):		4
CHEM 111 & 111L	Survey of Chemistry 1 and Survey of Chemistry 1 - Laboratory	
CHEM 115 & 115L	Fundamentals of Chemistry and Fundamentals of Chemistry 1 - Laboratory	
MATH 150	Applied Calculus (GEF 3)	3
PHYS 101	Introductory Physics (GEF 8)	4
STAT 211	Elementary Statistical Inference (GEF 8)	3
ARE 150 or ECON 201	Introductory Agricultural and Agribusiness Economics (GEF 4) Principles of Microeconomics	3
FOR 203	Careers in Natural Resources Management 2	1
FOR 205	Dendrology	3
FOR 240	Introduction to Computing in Natural Resources	3
FOR 438	Human Dimensions Natural Resource Management	3
FMAN 222	Forest Mensuration	4
WDSC 100	Forest Resources in United States History (GEF 5)	3
WDSC 223	Wood Anatomy and Structure	3
WDSC 232	Wood Grading and Procurement	3
WDSC 340	Physical Properties of Wood	3
WDSC 341	Wood Mechanics	3
WDSC 362	Forest Product Decision-Making	4
WDSC 413	Wood Chemistry	3
WDSC 422	Harvesting Forest Products	3
WDSC 465	Wood-based Composite Materials	3
WDSC 491	Professional Field Experience	3
Capstone Experience:		4
WDSC 480	Senior Projects 1	
WDSC 481	Senior Projects 2	
Area of Emphasis *		34
Processing		
Renewable Materials Marketing		
Sustainable Low-Rise Residential Construction		
Utilization		
Total Hours		113

- * For advanced students transferring into wood science and technology from a related major to qualify, the area of emphasis must:
1. Include a core consisting of at least fifteen semester hours of coursework from the student's previous major
 2. Must all be from a single discipline as indicated by the course prefix (i.e., FMAN)
 3. Must have been passed with a C grade or better, and
 4. Must be approved by the Wood Science and Technology Faculty

SUGGESTED PLAN OF STUDY

First Year

Fall	Hours	Spring	Hours
ENGL 101 (GEF 1)		3 ARE 150 or ECON 201 (GEF 4)	3
ANRD 191		1 FOR 240	3
WDSC 100 (GEF 5)		3 MATH 150 (GEF 3)	3
BIOL 101 & BIOL 103 (GEF 2)		4 GEF 6	3
WDSC 223		3 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
CHEM 111 & 111L (GEF 8)		4 WDSC 232	3
ENGL 102 (GEF 1)		3 PHYS 101 (GEF 8)	4
FOR 205		3 FOR 203	1
AoE Requirement		6 STAT 211 (GEF 8)	3
		AoE Requirement	3
		16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
WDSC 341		3 WDSC 340		3 WDSC 491	3
WDSC 413		3 FMAN 222		4	
WDSC 422		3 ENGL 304 or 305		3	
AoE Requirement		6 AoE Requirement		6	
		15		16	3

Fourth Year

Fall	Hours	Spring	Hours
FOR 438		3 WDSC 465	3
WDSC 362		4 WDSC 481	2
WDSC 480		2 AoE Requirement	7
AoE Requirement		6	
		15	12

Total credit hours: 120

Areas of Emphasis

- Processing (p. 4)
- Renewable Materials Marketing (p. 6)
- Sustainable Low-Rise Residential Construction (p. 7)
- Utilization (p. 8)

PROCESSING AREA OF EMPHASIS

WDSC 330	Wood Machining	3
WDSC 337	Wood Adhesion and Finishing	3

WDCS 351	Forest Products Protection	3
University Approved Minor *		15
Restricted Electives *		10
Total Hours		34

* Credit hours for the minor and restricted electives are estimates and are dependent upon selected minor. A minimum of 34 credit hours is needed under the area of emphasis. Restricted electives must contribute to the student's professional development and must be approved by the student's advisor.

SUGGESTED PLAN OF STUDY FOR THE PROCESSING AREA OF EMPHASIS

First Year

Fall	Hours	Spring	Hours
ENGL 101 (GEF 1)		3 ARE 150 or ECON 201 (GEF 4)	3
WDCS 223		3 FOR 240	3
ANRD 191		1 MATH 150 (GEF 3)	3
WDCS 100 (GEF 5)		3 GEF 6	3
BIOL 101 & BIOL 103 (GEF 2)		4 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
Select one of the following (GEF 8):		4 FOR 203	1
CHEM 111 & 111L		PHYS 101 (GEF 8)	4
CHEM 115 & 115L		WDCS 232	3
ENGL 102 (GEF 1)		3 STAT 211 (GEF 8)	3
FOR 205		3 Approved Restricted Elective	3
Approved Restricted Elective		3	
Approved Restricted Elective		3	
		16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
WDCS 330 (Alt. Yr.)		3 ENGL 304 or 305		3 WDCS 491	3
WDCS 341		3 FMAN 222			4
WDCS 413		3 WDCS 340			3
WDCS 422		3 WDCS 351			3
Minor Requirement		3 Minor Requirement			3
		15		16	3

Fourth Year

Fall	Hours	Spring	Hours
FOR 438		3 WDCS 465	3
WDCS 337		3 WDCS 481	2
WDCS 362		4 Minor Requirements	6
WDCS 480		2 Approved Restricted Elective	1

Minor requirement	3	
	15	12

Total credit hours: 120

RENEWABLE MATERIALS MARKETING AREA OF EMPHASIS

ACCT 201	Principles of Accounting 1	3
ARE 204	Agribusiness Management	3
ARE 461	Agribusiness Finance	3
BCOR 350	Principles of Marketing	3
WDSC 470	Marketing Forest Products	3
Select one of the following minors: *		15
Agribusiness Management		
Entrepreneurship		
General Business		
Restricted Elective *		4
Total Hours		34

* Credit hours for the minor and restricted electives are estimates and are dependent upon selected minor. A minimum of 34 credit hours is needed under the area of emphasis. Restricted electives must contribute to the student's professional development and must be approved by the student's advisor.

SUGGESTED PLAN OF STUDY FOR RENEWABLE MATERIALS MARKETING AREA OF EMPHASIS

First Year

Fall	Hours	Spring	Hours
BIOL 101 & BIOL 103 (GEF 2)		4 ARE 150 or ECON 201 (GEF 4)	3
ENGL 101 (GEF 1)		3 MATH 150 (GEF 3)	3
ANRD 191		1 FOR 240	3
WDSC 100 (GEF 5)		3 GEF 6	3
WDSC 223		3 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
ACCT 201		3 FOR 203	1
ARE 204		3 PHYS 101 (GEF 8)	4
Select one of the following (GEF 8):		4 STAT 211 (GEF 8)	3
CHEM 111 & 111L		WDSC 232	3
CHEM 115 & 115L		Approved Restricted Elective	3
ENGL 102 (GEF 1)		3	
FOR 205		3	
		16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
WDSC 341		3 ENGL 304 or 305		3 WDSC 491	3
WDSC 413		3 FMAN 222		4	
WDSC 422		3 WDSC 340		3	
Minor Requirement		3 WDSC 470 (alt. yr.)		3	

Minor Requirement		3 Minor Requirement		3
		15		16
Fourth Year				
Fall	Hours	Spring	Hours	
FOR 438		3 ARE 461		3
WDSC 362		4 BCOR 350		3
WDSC 480		2 WDSC 481		2
Minor Requirement		3 WDSC 465		3
Minor Requirement		3 Approved Restricted Elective		1
		15		12

Total credit hours: 120

SUSTAINABLE LOW-RISE RESIDENTIAL CONSTRUCTION AREA OF EMPHASIS

ID 205	Introduction to Architectural Building Technologies	3
or ID 305	Architectural Interior Building Systems and Construction	
SAFM 470	Managing Construction Safety	3
DSGN 340	Design for Energy Efficiency	3
WDSC 320	Sustainable Construction	3
Select one of the following minors: *		15
Agribusiness Management		
Entrepreneurship		
General Business		
Sustainable Design		
Restricted Electives *		7
Total Hours		34

* Credit hours for the minor and restricted electives are estimates and are dependent upon selected minor. A minimum of 34 credit hours is needed under the area of emphasis. Restricted electives must contribute to the student's professional development and must be approved by the student's advisor.

SUGGESTED PLAN OF STUDY FOR SUSTAINABLE LOW-RISE CONSTRUCTION AREA OF EMPHASIS

First Year

Fall	Hours	Spring	Hours
ENGL 101 (GEF 1)		3 ARE 150 or ECON 201 (GEF 4)	3
WDSC 223		3 FOR 240	3
ANRD 191		1 MATH 150 (GEF 3)	3
WDSC 100 (GEF 5)		3 GEF 6	3
BIOL 101 & BIOL 103 (GEF 2)		4 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
Select one of the following (GEF 8):		4 FOR 203	1
CHEM 111 & 111L		PHYS 101 (GEF 8)	4
CHEM 115 & 115L		WDSC 232	3
ENGL 102 (GEF 1)		3 Minor Requirement	3

FOR 205		3 STAT 211 (GEF 8)		3	
Restricted Elective		3			
Restricted Elective		3			
		16			14
Third Year					
Fall	Hours	Spring	Hours	Summer	Hours
WDSC 341		3 WDSC 340		3 WDSC 491	3
WDSC 413		3 FMAN 222		4	
WDSC 422		3 ENGL 304 or 305		3	
Minor Requirement		3 WDSC 320		3	
Minor Requirement		3 ID 205 or 305		3	
		15			16
Fourth Year					
Fall	Hours	Spring	Hours		
DSGN 340		3 SAFM 470		3	
FOR 438		3 WDSC 465		3	
WDSC 362		4 WDSC 481		2	
WDSC 480		2 Minor Requirement		3	
Minor Requirement		3 Restricted Elective		1	
		15			12

Total credit hours: 120

UTILIZATION AREA OF EMPHASIS

FHYD 444	Watershed Management	3
FMAN 212	Forest Ecology	3
FMAN 311	Silvicultural Systems	4
FMAN 330	Principles of Forestry Economics	4
FOR 326	Remote Sensing of Environment	3
WDSC 444	Bio-based Energy Systems	3
WMAN 234	Forest Wildlife Management	3
Restricted Electives *		11
Total Hours		34

* Restricted electives must contribute to the student's professional development and must be approved by the student's advisor.

SUGGESTED PLAN OF STUDY FOR THE UTILIZATION AREA OF EMPHASIS

First Year					
Fall	Hours	Spring	Hours		
ENGL 101 (GEF 1)		3 ARE 150 or ECON 201 (GEF 4)		3	
ANRD 191		1 FOR 240		3	
WDSC 100 (GEF 5)		3 MATH 150 (GEF 3)		3	
BIOL 101 & BIOL 103 (GEF 2)		4 GEF 6		3	
WDSC 223		3 GEF 7		3	
		14			15
Second Year					
Fall	Hours	Spring	Hours		
Select one of the following (GEF 8):		4 WDSC 232		3	
CHEM 111 & 111L (GEF 8)		PHYS 101 (GEF 8)		4	

CHEM 115 & 115L		FOR 203		1	
ENGL 102 (GEF 1)		3 STAT 211 (GEF 8)		3	
FOR 205		3 Approved Restricted Elective		3	
FMAN 212		3			
Approved Restricted Elective		3			
		16			14
Third Year					
Fall	Hours	Spring	Hours	Summer	Hours
ENGL 304 or 305		3 FMAN 222		4 WDSC 491	3
WDSC 341		3 FOR 326		3	
WDSC 413		3 WDSC 340		3	
WDSC 422		3 WMAN 234		3	
WDSC 444		3 Approved Restricted Elective		3	
		15			16
Fourth Year					
Fall	Hours	Spring	Hours		
FMAN 311		4 WDSC 465		3	
FOR 438		3 FMAN 330		4	
WDSC 362		4 FHYD 444		3	
WDSC 480		2 WDSC 481		2	
Approved Restricted Electives		2			
		15			12

Total credit hours: 120

Major Learning Outcomes

WOOD SCIENCE AND TECHNOLOGY

The Wood Science and Technology program established specific expected learning goals as part of the program's assessment plan. The plan was approved by the West Virginia University administration and the West Virginia Higher Education Board of Governors in 2007. The Society of Wood Science and Technology (SWST) Accreditation Standards were adopted as the stated expected learning goals of the plan, and include the following:

- Graduates will demonstrate a fundamental background in preparatory and general education courses in compliance with the requirements established by West Virginia University, the West Virginia Board of Governors, and the Accreditation standards of the Society of Wood Science and Technology.
- Graduates will demonstrate a firm understanding of basic wood sciences, including anatomy and biology of wood formation; wood identification; physical properties; mechanical properties; chemical characteristics and properties; wood degradation and deterioration; and composite materials.
- Graduates will demonstrate knowledgeable related to wood processing and manufacturing, including mechanical reduction of the raw material, drying processes, manufacture of solid wood products, manufacture of composite materials, chemical wood processing, and wood protection and enhancement.
- Graduates will be able to compare and contrast a variety of complex contemporary issues of wood use, including demand, use, and impact of use on society and the environment; applications of wood and wood-based materials; choosing and specifying appropriate wood-based products; policy, regulation, environmental and other societal issues; professional ethics; and health, safety, and security issues.
- Graduates will demonstrate competence in an area of professional emphasis that compliments their wood science and technology education.

WDSC 100. Forest Resources in United States History. 3 Hours.

Examines human use of forest resources in America from pre-Colombian times to present. Exploration of factors that impact the use of wood products.

WDSC 191. First-Year Seminar. 1-3 Hours.

Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

WDSC 223. Wood Anatomy and Structure. 3 Hours.

PR: FOR 205. Anatomy and structure of commercial wood species of the U.S. Survey of basic properties of wood.

WDSC 225. Finished Wood Products. 3 Hours.

Exploration of the different materials used in low-rise residential and commercial construction applications for finishing and design aspects. Emphasis will be placed on wood products.

WDSC 232. Wood Grading and Procurement. 3 Hours.

PR: Forestry major or consent. Conversion and grading of raw materials in log form to primary wood products. Introduction to timber procurement systems.

WDSC 245. Residential Building Materials. 3 Hours.

Exploration of the different building materials used in residential and commercial construction. Emphasis will be placed on solid and engineered wood products as well as their manufacturing processes.

WDSC 293. Special Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 320. Sustainable Construction. 3 Hours.

Introduction to common building practices used in residential construction with emphasis on sustainable, green construction.

WDSC 330. Wood Machining. 3 Hours.

Introduction to basic concepts of wood machining with emphasis on production equipment and furniture manufacturing. Special topics of wood joining techniques and methods. Analysis of operational safety, health hazards and accident prevention. (Fall of even years.)

WDSC 337. Wood Adhesion and Finishing. 3 Hours.

PR: Wood Industry major or consent; WDSC 223. Fundamentals of the bonding and finishing of wood including preparation, processing, and evaluation of adhesive and finishing systems.

WDSC 340. Physical Properties of Wood. 3 Hours.

PR: WDSC 223. Specific gravity and density of wood; relationships between wood and liquids and applications in wood seasoning; thermal electrical and acoustical properties.

WDSC 341. Wood Mechanics. 3 Hours.

PR: Wood science major or consent; and WDSC 223, and MATH 155, and PHYS 101. Introduction to static properties of selections, elementary mechanics of deformable bodies, axial loading, column and beam analysis, and design considerations. (2 hr. lec., 1 hr. lab.).

WDSC 351. Forest Products Protection. 3 Hours.

PR: WDSC 223. Biological organisms responsible for deterioration of wood products, their control by preservative methods, and study of fire retarding methods.

WDSC 362. Forest Product Decision-Making. 4 Hours.

PR: Junior standing in forestry and MATH 155 and STAT 211. Use of decision making tools and techniques by forest products industry professionals, including examples of control chart techniques and acceptance sampling techniques, simulation modeling, linear programming, forecasting and network analysis. (4 hr. lec.).

WDSC 393. Special Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 400. Forest Measurement Field Practice. 3 Hours.

PR: Wood industry major and FOR 205 and FMAN 322 and CE 200. Application of surveying and mensurational practices with emphasis on field problems.

WDSC 401. Wood Industries Field Trip. 1 Hour.

A one-week trip to observe manufacturing methods and techniques of commercial wood industry plants. Plants visited include furniture, plywood, veneer, hardboard, pulp and paper, sawmilling, and preservation.

WDSC 413. Wood Chemistry. 3 Hours.

PR: Wood science major or consent, and CHEM 231 or CHEM 233. Chemical composition of wood including cellulose, hemicellulose, and extractives. Chemical processing of wood.

WDSC 422. Harvesting Forest Products. 3 Hours.

PR: MATH 128 or equivalent and WDSC 232. Analysis of ground-based and cable harvesting systems, including time and motion studies, productivity and cost analysis, occupational safety and health, environmental issues, equipment evaluation and selection, and trucking of forest products. (2 hr. lec., 1 hr. lab.).

WDSC 423. Forest Roads. 4 Hours.

PR: CE 200 and CS 101. A study of techniques and methods of design, layout and construction details of various standards of forest roads.

WDSC 444. Bio-based Energy Systems. 3 Hours.

Introduction to biomass feedstock production for bioenergy application, preprocessing and characterization, biofuel conversion technologies, economic and environmental impacts, and greenhouse gas emissions.

WDSC 460. Plant Layout for Wood Industries. 3 Hours.

PR: Senior standing. Relates knowledge of wood product processes to optimize production. Study of proper arrangement of machines, and work and storage areas.

WDSC 465. Wood-based Composite Materials. 3 Hours.

PR: WDSC 232 and WDSC 340 and WDSC 341. Fundamentals of manufacturing wood-based composite materials, including processing, products, evaluation, and applications in the marketplace. (2 hr. lec., 1 hr. lab.).

WDSC 470. Marketing Forest Products. 3 Hours.

This course will examine techniques used by the forest products industry to market commodity, value-added specialty, and sustainable (i.e., green) products.

WDSC 480. Senior Projects 1. 2 Hours.

Senior project requires students to identify manwood science related problem, perform a literature review, and develop a plan for research to be completed in WDSC 481.

WDSC 481. Senior Projects 2. 2 Hours.

PR: WDSC 480. Senior project requires students to use knowledge from other courses to conduct research proposed in WDSC 480 and analyze results and prepare a technical report.

WDSC 490. Teaching Practicum. 1-3 Hours.

PR: Consent. Teaching practice as a tutor or assistant.

WDSC 491. Professional Field Experience. 1-18 Hours.

PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

WDSC 493. Special Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 494. Seminar. 1-3 Hours.

PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

WDSC 495. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

WDSC 496. Senior Thesis. 1-3 Hours.

PR: Consent.

WDSC 498. Honors. 1-3 Hours.

PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.