

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
- 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.

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 for 2025-2026

- 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).

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.

Code	Title	Hours
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.

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

University Requirements

Code	Title	Hours
	General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)	
	Outstanding GEF Requirements 6 and 7	6
ANRD 191	First-Year Seminar	1
Total Hours		7

Wood Science and Technology Major Requirements

Code	Title	Hours
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 & 101L	General Biology 1 and General Biology 1 Laboratory (GEF 2)	4
Select one of the following (fulfills Writing and Communication Skills requirement):		3
WRIT 304	Business and Professional Writing	
WRIT 305	Technical Writing	
Select one of the following (GEF 8):		4
CHEM 111 & 111L	Survey of General, Organic, and Biological Chemistry 1 and Survey of Chemistry 1 Laboratory	
CHEM 115 & 115L	Fundamentals of Chemistry 1 and Fundamentals of Chemistry 1 Laboratory	
MATH 150	Applied Calculus (GEF 3)	3
PHYS 101 & 101L	Introductory Physics 1 and Introductory Physics 1 Laboratory (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
FNRS 203	Careers in Natural Resources Management 2	1
FNRS 205	Dendrology	2
FNRS 205L	Dendrology Laboratory	1
FNRS 240	Introduction to Computing in Natural Resources	3
FNRS 240L	Introduction to Computing in Natural Resources Laboratory	0
FNRS 438	Human Dimensions Natural Resource Management	3
FNRS 222	Forest Mensuration	4
FNRS 222L	Forest Mensuration Laboratory	0
FNRS 100	Forest Resources in United States History	3
FNRS 223	Wood Anatomy and Structure	3
FNRS 223L	Wood Anatomy and Structure Laboratory	0
FNRS 232	Wood Grading and Procurement	3
FNRS 232L	Wood Grading and Procurement Laboratory	0
FNRS 340	Physical Properties of Wood	3
FNRS 340L	Physical Properties of Wood Laboratory	0
FNRS 341	Wood Mechanics	3
FNRS 341L	Wood Mechanics Laboratory	0
FNRS 362	Forest Product Decision-Making	4
FNRS 413	Wood Chemistry	3
FNRS 413L	Wood Chemistry Laboratory	0
FNRS 422	Harvesting Forest Products	3
FNRS 422L	Harvesting Forest Products Laboratory	0
FNRS 465	Wood-Based Composite Materials	3
FNRS 465L	Wood-Based Composite Materials Laboratory	0
FNRS 491	Professional Field Experience	3
Capstone Experience:		4
FNRS 480	Senior Projects 1	
FNRS 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., FNRS)
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 FNRS 240	3
FNRS 100		3 FNRS 240L	0
BIOL 101 & 101L (GEF 2)		4 MATH 150 (GEF 3)	3
FNRS 223		3 GEF 6	3
FNRS 223L		0 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
CHEM 111 & 111L (GEF 8)		4 FNRS 232	3
ENGL 102 (GEF 1)		3 FNRS 232L	0
FNRS 205		2 PHYS 101 (GEF 8)	4
FNRS 205L		1 FNRS 203	1
AoE Requirement		6 STAT 211 (GEF 8) AoE Requirement	3 3
		16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
FNRS 341		3 FNRS 340		3 FNRS 491	3
FNRS 341L		0 FNRS 340L		0	
FNRS 413		3 FNRS 222		4	
FNRS 413L		0 FNRS 222L		0	
FNRS 422		3 WRIT 304 or 305		3	
FNRS 422L		0 AoE Requirement		6	
AoE Requirement		6			
		15		16	3

Fourth Year

Fall	Hours	Spring	Hours
FNRS 438		3 FNRS 465	3
FNRS 362		4 FNRS 465L	0
FNRS 480		2 FNRS 481	2
AoE Requirement		6 AoE Requirement	7
		15	12

Total credit hours: 120

Areas of Emphasis

- Processing
- Sustainable Low-Rise Residential Construction
- Utilization

PROCESSING AREA OF EMPHASIS

Code	Title	Hours
FNRS 333	Wood Machining	3
FNRS 337 & 337L	Wood Adhesion and Finishing and Wood Adhesion and Finishing Laboratory	3
FNRS 351 & 351L	Forest Products Protection and Forest Products Protection Laboratory	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
FNRS 223		3 FNRS 240	3
FNRS 223L		0 FNRS 240L	0
ANRD 191		1 MATH 150 (GEF 3)	3
FNRS 100 (GEF 5)		3 GEF 6	3
BIOL 101 & 101L (GEF 2)		4 GEF 7	3
		14	15

Second Year

Fall	Hours	Spring	Hours
Select one of the following (GEF 8):		4 FNRS 203	1
CHEM 111 & 111L		PHYS 101 (GEF 8)	4
CHEM 115 & 115L		FNRS 232	3
ENGL 102 (GEF 1)		3 FNRS 232L	0
FNRS 205		2 STAT 211 (GEF 8)	3
FNRS 205L		1 Approved Restricted Elective	3
Approved Restricted Elective		3	
Approved Restricted Elective		3	
		16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
FNRS 333		3 WRIT 304 or 305		3 FNRS 491	3
FNRS 341		3 FNRS 222		4	
FNRS 341L		0 FNRS 222L		0	

FNRS 413	3 FNRS 340	3	
FNRS 413L	0 FNRS 340L	0	
FNRS 422	3 FNRS 351	3	
FNRS 422L	0 FNRS 351L	0	
Minor Requirement	3 Minor Requirement	3	
	15	16	3

Fourth Year

Fall	Hours	Spring	Hours	
FNRS 438		3 FNRS 465		3
FNRS 337		3 FNRS 465L		0
FNRS 337L		0 FNRS 481		2
FNRS 362		4 Minor Requirements		6
FNRS 480		2 Approved Restricted Elective		1
Minor requirement		3		
		15		12

Total credit hours: 120

SUSTAINABLE LOW-RISE RESIDENTIAL CONSTRUCTION AREA OF EMPHASIS

Code	Title	Hours
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
FNRS 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
FNRS 223		3 FNRS 240		3
FNRS 223L		0 FNRS 240L		0
ANRD 191		1 MATH 150 (GEF 3)		3
FNRS 100		3 GEF 6		3
BIOL 101 & 101L (GEF 2)		4 GEF 7		3
		14		15

Second Year

Fall	Hours	Spring	Hours	
Select one of the following (GEF 8):		4 FNRS 203		1
CHEM 111 & 111L		PHYS 101 (GEF 8)		4
CHEM 115 & 115L		FNRS 232		3
ENGL 102 (GEF 1)		3 FNRS 232L		0
FNRS 205		2 Minor Requirement		3
FNRS 205L		1 STAT 211 (GEF 8)		3
Restricted Elective		3		
Restricted Elective		3		
			16	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
FNRS 341		3 FNRS 340		3 FNRS 491	3
FNRS 341L		0 FNRS 340L		0	
FNRS 413		3 FNRS 222		4	
FNRS 413L		0 FNRS 222L		0	
FNRS 422		3 WRIT 304 or 305		3	
FNRS 422L		0 FNRS 320		3	
Minor Requirement		3 ID 205 or 305		3	
Minor Requirement		3			
			15	16	3

Fourth Year

Fall	Hours	Spring	Hours	
DSGN 340		3 SAFM 470		3
FNRS 438		3 FNRS 465		3
FNRS 362		4 FNRS 465L		0
FNRS 480		2 FNRS 481		2
Minor Requirement		3 Minor Requirement		3
		Restricted Elective		1
			15	12

Total credit hours: 120

UTILIZATION AREA OF EMPHASIS

Code	Title	Hours
FNRS 444	Watershed Management	3
FNRS 212	Forest Ecology	3
FNRS 212L	Forest Ecology Laboratory	1
FNRS 311	Silvicultural Systems	4
FNRS 311L	Silvicultural Systems Laboratory	0
FNRS 330	Principles of Forestry Economics	4
FNRS 330L	Principles of Forestry Economics Laboratory	0
FNRS 326	Remote Sensing of Environment	3
FNRS 445	Bio-based Energy Systems	3
WMAN 150	Principles of Conservation Ecology	3
Restricted Electives *		11
Total Hours		35

*

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 FNRS 240	3
FNRS 100		3 MATH 150 (GEF 3)	3
BIOL 101 & 101L (GEF 2)		4 GEF 6	3
FNRS 223		3 GEF 7	3
FNRS 223L		0	
		14	15

Second Year

Fall	Hours	Spring	Hours
Select one of the following (GEF 8):		4 FNRS 232	3
CHEM 111 & 111L (GEF 8)		FNRS 232L	0
CHEM 115 & 115L		PHYS 101 & 101L (GEF 8)	4
ENGL 102 (GEF 1)		3 FNRS 203	1
FNRS 205		2 STAT 211 (GEF 8)	3
FNRS 205L		1 Approved Restricted Elective	3
FNRS 212		3	
FNRS 212L		1	
Approved Restricted Elective		3	
		17	14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
WRIT 304 or 305		3 FNRS 222		4 FNRS 491	3
FNRS 341		3 FNRS 222L		0	
FNRS 341L		0 FNRS 326		3	
FNRS 413		3 FNRS 340		3	
FNRS 413L		0 FNRS 340L		0	
FNRS 422		3 WMAN 150		3	
FNRS 422L		0 Approved Restricted Elective		3	
FNRS 445		3			
		15		16	3

Fourth Year

Fall	Hours	Spring	Hours
FNRS 311		4 FNRS 465	3
FNRS 311L		0 FNRS 465L	0
FNRS 438		3 FNRS 330	4
FNRS 362		4 FNRS 330L	0
FNRS 480		2 FNRS 444	3

Approved Restricted Electives	2 FNRS 481	2
	15	12

Total credit hours: 121

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.