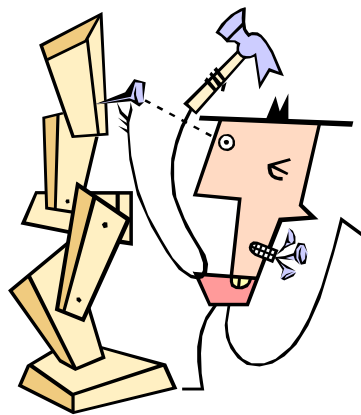


Wood Products

School of Forest Resources
College of Agricultural Sciences
The Pennsylvania State University



2009 - 2010

Student Handbook

<http://www.sfr.cas.psu.edu/>

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School of Forest Resources

The School of Forest Resources is an academic unit in the College of Agricultural Sciences at Penn State. The school's mission is to provide educational opportunities and science-based information to protect, manage, and use natural resources for sustained benefits. This is accomplished through educational, research, and service programs in forestry, wildlife and fisheries, wood products, and related areas.

The School of Forest Resources offers two associate in science (A.S.) degree programs: Forest Technology (at Penn State Mont Alto) and Wildlife Technology (at Penn State DuBois); and three bachelor of science (B.S.) degree programs: Forest Science, Wildlife and Fisheries Science, and Wood Products. A minor in each of these latter three areas is also offered. In addition, the school has graduate programs at both the master's and doctorate levels. The director and faculty of the school are committed to quality teaching.

Undergraduate Programs Office

The School of Forest Resources (SFR) Undergraduate Programs Office is housed in 113 Forest Resources Building at Penn State University Park; phone (814) 865-4237. Dr. Paola Ferreri is the associate director for academic programs, Jamie Murphy is the program coordinator, and Dana Whaley is the staff assistant.

Each student in the School of Forest Resources is assigned an academic adviser. For students at the University Park campus, advising assignments are made by the SFR Undergraduate Programs Office.

Any student enrolled in or thinking about enrolling in a major in the School of Forest Resources, regardless of campus location, is encouraged to contact the SFR Undergraduate Programs Office for additional information. Additional information regarding the school's academic programs, scholarships, student activities and professional societies, faculty, and facilities is available on our Web site: www.sfr.psu.edu.

Undergraduate Programs Office
School of Forest Resources
The Pennsylvania State University
113 Forest Resources Building
University Park, PA 16802-4301
phone (814) 865-4237
fax (814) 865-3725

How to Use This Handbook

This handbook is a tool to help you plan your academic career and meet all of the requirements to complete your bachelor of science degree in Wood Products (W P). **This handbook is not intended to replace regular meetings with your academic adviser.** It is important to follow the requirements in the handbook specific to your program year. Your program year is the year that you declared your major in W P. This differs from your general education year, which is the year you entered Penn State as a degree student. This handbook refers to the general education and program requirements for 2009-2010. You should use the Baccalaureate Degree Programs listing online to determine your general education requirements:

<http://bulletins.psu.edu/bulletins/bluebook/>. For example, the average freshman student entering Penn State in the fall of 2009 will not declare a major until 2011. Thus, this student's general education year is 2009 and his/her program year is 2011. If you are unsure of your general education or program year, please see your adviser. You can also get this information from your degree audit, which can be obtained online at <https://elion.oas.psu.edu/>.

Wood Products Undergraduate Program

Introduction

The nation's forests are a major renewable natural resource from which a wide variety of wood products are derived: paper and packaging, construction materials, furniture and cabinets, chemicals and fuels. Wood is strong, lightweight, versatile, abundant, and renewable, and can be converted to finished products with the use of far less energy than most other industrial materials. In fact, the Wood Products Industry is one of the only industries in the US that is energy independent; the Wood Products Industry is capable of generating all the energy it needs from its own scrap materials.

The forest products industry accounts for more than 7% of US manufacturing output, employs nearly 1.5 million people, and ranks among the top ten manufacturing employers in 42 states (www.afandpa.org). Annual shipments totaled \$251 billion in 2005, according to the Bureau of Economic Analysis at the Department of Commerce. Wood products industry markets are global.

In Pennsylvania, the lumber, wood, and paper industry includes over 4,300 firms. These firms account for over \$15 billion in shipments annually. This industry grouping employs about 105,000 Pennsylvanians.

The Wood Products program has a long history at Penn State. The Board of Trustees first approved a curriculum in Wood Utilization in 1942. The first graduate students to complete their Master of Forestry with a specialization in Wood Utilization graduated in 1947. In 1961, the bachelor's degree program in Wood Utilization was replaced by Wood Science, which was again revised and renamed Forest Products in 1975. Effective fall 1992, the program name was changed to Wood Products and two program options—Business and Marketing, and Processing and Manufacturing—were developed. A Wood Products Marketing minor was also created. Today the Wood Products program at Penn State is nationally recognized and professionally accredited by the Society of Wood Science and Technology (SWST).

The Wood Products Processing and Manufacturing option closely resembles the prior Forest Products program. It focuses on wood science and technology and on the conversion of wood into products. Students in the Processing and Manufacturing option strengthen their training by selecting technical electives that emphasize fiber science, the material sciences, engineering, chemistry, or the biological sciences. Graduates may find employment in industry, trade associations, government, and universities, and may continue their education in a graduate program with a science or engineering orientation.

The Wood Products Business and Marketing option is one of only a few of its kind in North America. It resulted from discussions with employers, as well as discussions with faculty in other forest-products-related programs throughout the nation. Increased sophistication of business and marketing within the industry also played a role in developing this option. For example, a recent survey clearly indicated the need for potential employees to have not only a solid base in wood technology and building technology, but also a very strong complement of business-related skills such as management, marketing, and finance. Students in the Wood Products Business and Marketing option receive instruction in the basic sciences, computer programming, business management, and marketing while focusing on the technical aspects of wood products and related manufacturing technologies.

The Wood Products Marketing minor offers students in other majors the opportunity to develop a basic competency in wood products marketing and processing, including knowledge and skills helpful for those who wish to seek sales employment in wood products industries.

Objectives

The Wood Products program has the following objectives:

1. Efficiently transfer scientific and technological knowledge to undergraduate students in the areas of wood science, technology, and conversion of the timber resource base into useful products for society.
2. Enhance students' writing, speaking, and leadership skills in a professional setting.
3. Provide a problem-oriented education to students so that they can solve future problems facing the wood products industry and the nation.

Careers for Wood Products Majors

Placement studies have consistently shown excellent professional-level employment of Wood Products graduates in North America. There are fewer than 25 Wood Products programs in the United States and our unique program is one of only 10 that are accredited. Surveys continually show that there are more jobs available than there are Wood Products graduates.

The wood products industry uses state-of-the-art technical equipment in manufacturing facilities that cost hundreds of millions of dollars, and the market for wood products is global. Therefore, the industry needs highly trained professionals with both excellent technical and communicational skills.

Wood Products Business and Marketing

The role of marketing within the wood products community is becoming increasingly important. The marketing concept of a customer-oriented, integrated, company-wide activity is a central theme within industry, academia, and governmental policy-making environments. Elements such as quality, value, and customer satisfaction, among others, are conceptualized, planned, and executed via marketing efforts.

The concept of social marketing, which incorporates environmental or "green marketing," is also being increasingly discussed and addressed throughout the wood industry. How a firm, industry, or nation chooses to address the fundamental issue of maintaining the environment for future generations, and how this issue can be translated honestly and objectively into a competitive advantage, are topics of great importance to wood products marketing professionals.

Students who specialize in Wood Products Business and Marketing may have their first job in sales, moving later to management of a district or national account. Others may go into retail management in the rapidly growing home improvement center industry, beginning in a trainee position and typically advancing to assistant manager and then store manager in two to five years. Still others with an analytical aptitude may be employed as a market research analyst or product-market manager in corporate headquarters. Graduates may also continue their education in an MBA or other advanced degree program in business or marketing.

Wood Products Processing and Manufacturing

Because of the inherent advantages of wood, and because world populations are growing and standards of living are increasing, demand for wood products is growing. Individuals with training in applied or basic research, technical service functions, and manufacturing processes will be key players in initiatives to satisfy that growing demand. Wood products knowledge will also be a key asset in the search for alternative fuels.

Graduates of the Wood Products Processing and Manufacturing option may find employment in industry, government, and universities. Opportunities in industry are with both small and large firms such as Georgia Pacific, Weyerhaeuser, Trus Joist MacMillan, National Caseins, and International Paper. Numerous technical service positions are filled by Penn State graduates in the cabinet, furniture, sawmill, wood composite, adhesive, paint, finishing, bioenergy, and green building industries. Graduates may continue their education in advanced degree programs with a science or engineering orientation. Students with advanced degrees are employed in research positions with government and universities, as well as with industries and trade associations.

Wood Products Curriculum Requirements

125 credits are required for a Bachelor of Science degree in Wood Products.
(Individual course credits are given in parentheses.)

*Courses required for **BOTH Options**:*

COMMUNICATIONS

- CAS 100A, B, or C GWS - Effective Speech (3)
- ENGL 015 GWS - Rhetoric and Composition (3)
- ENGL 202C or 202D GWS - Technical or Business Writing (3)
- ENGL 215 or CAS 211 - Article Writing (3) or Informative, Technical, and Presentational Speaking (3)

QUANTIFICATION

- MATH 110 GQ - Techniques of Calculus I (4)
- MATH 111 GQ - Techniques of Calculus II (2)
- CMPSC 101 GQ, 103 GQ, 201C GQ, 201F GQ, or 203 GQ - Introduction to Algorithmic Processes (3), Introduction to Programming Techniques (4), Computer Programming for Engineers (3), or Principles of Programming with Business Applications (4)
- STAT 200 GQ, 240 GQ, 250 GQ, or 301 GQ - Elementary Statistics (4), Introduction to Biometry (3), Introduction to Biostatistics (3), or Statistical Analysis I (3)

NATURAL SCIENCES

- Selections from the University-approved Natural Sciences list [GN] (9).

ARTS

- Selections from the University-approved Arts list [GA] (6)

HUMANITIES

- Selections from University-approved Humanities list [GH] (6)

SOCIAL AND BEHAVIORAL SCIENCES

- ECON 002 GS, 004 GS, or 014 GS - Introductory Microeconomic Analysis and Policy (3), Introductory Macroeconomic Analysis and Policy (3), or Principles of Economics (3)
- Selection from the University-approved Social and Behavioral Sciences list [GS] (3)

HEALTH SCIENCES and PHYSICAL EDUCATION

- Selection from the University-approved Health Sciences and Physical Education course list [GHA] (3)

ELECTIVES (2-6 credits)

Selection(s) of choice, excluding remedial courses

UNITED STATES CULTURES and INTERNATIONAL CULTURES (6 credits)

Must select 3 credits of University-approved United States Cultures (US) and 3 credits of University-approved International Cultures (IL). This requirement can be satisfied in combination with requirements in Arts (GA), Humanities (GH), or Social and Behavioral Sciences (GS).

FIRST-YEAR SEMINAR (minimum 1 credit)

Must select a minimum of 1 credit of First-Year Seminar.

WRITING-INTENSIVE COURSE WORK (3 credits)

Must select 3 credits of writing-intensive course work (W) in your major or college of enrollment. Writing-intensive requirement is satisfied by completion of W P 200W.

PRESCRIBED COURSES

- W P/FOR 200W - Professional Careers in Forest Resources (3)
- W P 203 - Anatomical Properties of Wood (1)
- W P 411 - Wood-Environmental Relationships (4)
- W P 417 - Wood Products Manufacturing Systems and Processes (4)
- W P 437W - Wood Industries Marketing Management (4)
- W P 490 - Wood Products Colloquium (1)
- FOR 203 - Field Dendrology (3)

Notes:

Note: Acceptable selections for Arts, Humanities, Social and Behavioral Sciences, United States Cultures, International Cultures, Health Sciences and Physical Education, and First-Year Seminar are listed in the *General Education in the Curriculum* handbook, or on the Web at <http://www.psu.edu/bulletins/bluebook/gened/>.

When a required course has both a lecture and practicum portion, such as PHYS 215L and PHYS 215P, students are required to take both portions.

Additional courses required for the Business and Marketing option:

WOOD PRODUCTS

- W P 435 - Wood Products Production and Sales Management (3)
- W P 400 – Properties of Wood- Chemical, structural, and mechanical properties (2)
- W P 416 – Wood Industries Management Development- Managerial concepts & issues important to forest products organizations

ADDITIONAL COURSES

24 credits in Business/Marketing selections. Select from the following list of courses:

- ◆ ACCTG 211 - Financial and Managerial Accounting for Decision Making
- ◆ AG BM 101 GS or ECON 002 GS - Economic Principles of Agribusiness Decision Making or Intro Microeconomic Analysis and Policy
- ◆ AG EC 350 - International Agric Trade
- ◆ B A 250 - Small Business Management
- ◆ B LAW 243 - Legal Environ. of Business
- ◆ SCM 301 - Business Logistics Mgmt
- ◆ ECON 004 GS - Introductory Macroeconomic Analysis and Policy
- ◆ FIN 100 - Introduction to Finance
- ◆ ECON 315 or L S I R 100 - Labor Economics or Industrial Relations
- ◆ I B 303 or ECON 333 - International Business Operations or International Econ
- ◆ I E 302 - Engineering Economy
- ◆ MGMT 100 - Survey of Management
- ◆ MKTG 221 - Contemp Amer. Marketing
- ◆ PSYCH 100 GS – Intro. Psychology
- ◆ Any MS&IS course or CMPSC 203 GQ - Intro to Spreadsheets Databases
- ◆ Any additional Wood Products course

SUPPORTING COURSES

- 14-16 credits selected in consultation with a Wood Products adviser from the following:

Accounting	Comm. Art and Sci. 150-499	Mathematics 220 to 499
Agricultural Engineering	Communications	Materials Science
Agricultural Economics	Computer Science	Marketing
Agricultural Education 440	Economics	Management
Business Administration	Electrical Engineering	Mechanical Engineering
Biochemistry	Engineering Graphics	Physics
Biology	Engineering Mechanics	Polymer Science
Biological Science	Entomology	Statistics
Business Law	English	Wildlife and Fisheries Science
Business Logistics	Finance	Wood Products
Civil Engineering	Forestry	3 credits of ROTC
Chemistry	Industrial Education	
Chemical Engineering	Industrial Engineering	

Additional courses required for the Processing and Manufacturing option:

WOOD PRODUCTS

- W P 337 - Wood Technology (2)
- W P 412 - Wood in Structures (3)
- W P 413 - Chemistry of Wood (3)
- W P 418 - Chemical Processing of Wood (4)
- W P 423 - Deterioration and Protection of Wood Products (2)

ADDITIONAL COURSES

- CHEM 110 (formerly 012) GN - Chemical Principles (3)
- CHEM 112 (formerly 013) GN - Chemical Principles (3)
- CHEM 111 (formerly 014) GN - Experimental Chemistry (1)
- 17-19 credits from BIOL, BI SC GN, PHYS GN, Biochemistry, or Organic Chemistry

SUPPORTING COURSES

- 15 credits selected in consultation with a Wood Products adviser from the following:

Accounting	Communications	Industrial Engineering
Agricultural Engineering	Comm. Art and Sci 150-499	Mathematics 220 to 499
Agricultural Economics	Computer Science	Materials Science
Agricultural Education 440	Economics	Marketing
Business Administration	Electrical Engineering	Management
Biochemistry	Engineering Graphics	Mechanical Engineering
Biology	Engineering Mechanics	Physics
Biological Science	Entomology	Polymer Science
Business Law	English	Statistics
Business Logistics	Finance	Wildlife and Fisheries Science
Civil Engineering	Forestry	Wood Products
Chemistry	Industrial Education	3 credits of ROT C
Chemical Engineering		

**All students are strongly encouraged to participate in undergraduate research experience as work study, internship, or for credit (listed as W P 495 or 496). These credits can be used as supporting courses.

Please see the internship handbook at: <http://www.sfr.cas.psu.edu/Students/Handbooks.html>

**Recommended Academic Plan for Wood Products - Business and Marketing at
Commonwealth Campuses and University Park, Effective Summer 2008**

Semester 1 (fall)	Credits	Semester 2 (spring)	Credits
Natural Science (GN)	3	ENGL 015 or 030 (GWS)	3
MATH 110 or 140 (GQ)	4	CMPSC 101 , 201 or 203	3-4
Social and Behavioral Sciences (GS)	3	Business and Marketing Selection	3
Humanities (GH)	3	Arts (GA)	3
First-Year Seminar	1-3	MATH 111 or 141	2-4
Total Credits:	14-16	Total Credits:	14-17
Semester 3	Credits	Semester 4	Credits
WP 200W	3	Arts (GA)	3
FOR 203	3	Business and Marketing Selection	3
W P 203	1	CAS 100 (GWS) <i>Effective Speech</i>	3
ECON 002 (GS) (or ECON 004 (GS))	3	Natural Science (GN)	3
STAT 200 , 240 , 250 , or 301 (GQ)	3-4	Humanities (GH)	3
Natural Science (GN)	3	Health and Physical Activity (GHA)	1.5
Total Credits:	16-17	Total Credits:	16.5
Semester 5	Credits	Semester 6	Credits
Business and Marketing Selection	3	W P 435 (odd year) or W P 417 (even year)	3-4
Supporting Course selections	6	Business and Marketing Selection	3-6
W P 411	4	W P 400 (odd year) or Supporting Course selection	2-3
Elective or W P 416 (odd year)	3	W P 490 (odd year) or W P 437W (even year)	1-4
		Supporting Course selection	3
Total Credits:	16	Total Credits:	15-17
Semester 7	Credits	Semester 8	Credits
Business and Marketing Selection	6	W P 435 (odd year) or W P 417 (even year)	3-4
ENGL 202C (GWS)	3	Business and Marketing Selection	3-6
Elective or W P 416 (odd year)	3	W P 490 (odd year) or W P 437W (even year)	1-4
Supporting Course selection	3	W P 400 (odd year) or Supporting Course selection	2-3
Health and Physical Activity (GHA)	1.5	ENGL 215 or CAS 211	3
Total Credits:	16.5	Total Credits:	15-17

Bold type indicates courses requiring a quality grade of C or better.

- *Italics* indicates courses that satisfy both major and General Education requirements.
- ***Bold Italics*** indicates courses requiring a quality grade of C or better and that satisfy both major and General Education requirements.
- GWS, GHA, GQ, GN, GA, GH, and GS are codes used to identify General Education requirements.
- US, IL, and US;IL are codes used to designate courses that satisfy University United States/International Cultures requirements.
- W is the code used to designate courses that satisfy University Writing Across the Curriculum requirements.

Scheduling patterns for courses not taught each semester: Many W P classes are only taught every other year, in the fall OR the spring. It is crucial that you plan ahead and schedule accordingly. See an adviser if you have questions.

Program Notes: All supporting course selections are listed on the School's Web site (www.sfr.cas.psu.edu) in the Wood Products Handbook (under *Current Students*). Please also note that W P 200W, FOR 203, and W P 203 are offered only in the fall semester and *must be taken concurrently*, preferably in the 3rd semester. Because of the requirements of these courses, it is recommended that students do not take any other courses on Tuesdays and Thursdays that same semester.

Academic Advising Notes: US and IL cultures may count twice with GA, GH, or GS course

Course Scheduling Tips

All Wood Products students should change their campus location to University Park by the start of their sophomore year (your third semester). It is extremely helpful to complete calculus, statistics, and chemistry requirements as early as possible.

Acceptable selections for Arts, Humanities, Social and Behavioral Sciences, United States Cultures, International Cultures, Health Sciences and Physical Education, and First-Year Seminar are listed in the *General Education in the Curriculum* handbook, or on the Web at http://bulletins.psu.edu/bulletins/bluebook/general_education.cfm.

When a required course has both a lecture and practicum portion, such as PHYS 250L and PHYS 250P, students are required to take both portions.

Please contact Jamie Murphy with any scheduling questions (jam563@psu.edu or 814-863-0362).

Recommended Academic Plan for Wood Products- Processing and Manufacturing at Commonwealth Campuses and University Park, Effective Summer 2008

Semester 1 (fall)	Credits	Semester 2 (spring)	Credits
Natural Science (GN)	2-3	ENGL 015 or 030 (GWS)	3
MATH 110 or 140 (GQ)	4	CHEM 111 (GN)	1
CHEM 110 (GN)	3	CHEM 112 (GN)	3
Humanities (GH)	3	Arts (GA)	3
Social and Behavioral Sciences (GS)	3	BIOL (GN), BI SC (GN), PHYS (GN) biochemistry, or organic chemistry	3
First-Year Seminar	1-3	MATH 111 or 141	2-4
Total Credits:	16-18	Total Credits:	15-17
Semester 3	Credits	Semester 4	Credits
W P 200W	3	STAT 200 , 240 , 250 , or 301 (GQ)	3-4
FOR 203	3	BIOL (GN), BI SC (GN), PHYS (GN) biochemistry, or organic chemistry	4
W P 203	1	CAS 100 (GWS) <i>Effective Speech</i>	3
ECON 002 (GS) (or ECON 004 (GS))	3	Humanities (GH)	3
BIOL (GN), BI SC (GN), PHYS (GN) biochemistry, or organic chemistry	4	Health and Physical Activity (GHA)	1.5
CMPSC 101 , 201 or 203	3-4		
Total Credits:	17-18	Total Credits:	15.5-16.5
Semester 5	Credits	Semester 6	Credits
W P 411	4	W P 412 (odd year) or W P 337 (even year)	2-3
W P 418 (even year) or W P 413 (odd year)	3-4	W P 423 (odd year) or W P 417 (even year)	2-4
Arts (GA)	3	W P 490 (odd year) or W P 437W (even year)	1-4
BIOL (GN), BI SC (GN), PHYS (GN) biochemistry, or organic chemistry	3-4	BIOL (GN), BI SC (GN), PHYS (GN) biochemistry, or organic chemistry	3-4
Health and Physical Activity (GHA)	1.5	Supporting Course selections	3
Total Credits:	14.5-16.5	Total Credits:	13-18
Semester 7	Credits	Semester 8	Credits
W P 418 (even year) or W P 413 (odd year)	3-4	W P 412 (odd year) or W P 337 (even year)	2-3
ENGL 202C (GWS)	3	W P 423 (odd year) or W P 417 (even year)	2-4
Elective	3	W P 490 (odd year) or W P 437W (even year)	1-4
Supporting Course selections	6	Supporting Course selections	6
		ENGL 215 or CAS 211	3
Total Credits:	15-16	Total Credits:	14-16

- **Bold type** indicates courses requiring a quality grade of C or better.
- *Italics* indicates courses that satisfy both major and General Education requirements.
- ***Bold Italics*** indicates courses requiring a quality grade of C or better and that satisfy both major and General Education requirements.
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When a required course has both a lecture and practicum portion, such as PHYS 250L and PHYS 250P, students are required to take both portions.

Please contact Jamie Murphy with any scheduling questions (jam563@psu.edu or 814-863-0362).

Student				Checksheet, Wood Products, Business & Marketing Option <i>Effective Spring 2009, 125 Credits Required</i> The Pennsylvania State University College of Agricultural Sciences School of Forest Resources				Adviser							
Student Number								Gen. Ed. Year		Program Year					
E-mail Address								Date							
Requirements for the Major								General Education <i>(Effective Summer 2005)</i>							
Sem	Course	Credits	Grade	Sem	Course	Credits	Grade	Sem.	Course	Credits	Grade				
Prescribed Courses for the Major (26 cr.)				Prescribed Course for the Option (8 cr.)				Communication (9 cr. GWS)							
	MATH 110	4			W P 435	3			ENGL 015	3					
	MATH 111	2			W P 400	2									
	FOR 203*	3			W P 416	3			CAS 100A, B, or C	3					
	W P 200W*	3		Additional Courses for the Option (24 cr.) Select 24 credits from: ACCTG 211, AG BM 101 or ECON 002, AG EC 350, BA 250, B LAW 243, B LOG 301, ECON 004, ECON 315 or LER 100, FIN 100, I B 303 or ECON 333, I E 302, MGMT 100, MKTG 221, PSY 002, any additional W P courses, any MS&IS course or CMPSC 203.				and ENGL 202C GWS							
	W P 203*	1						Quantification (6 cr. GQ) MATH GQ and STAT GQ							
	W P 411	4		Natural Sciences (9 cr. GN) 3 3 3				Arts (6 cr. GA)							
	W P 417*	4						3							
	W P 437W*	4						3							
	W P 490*	1		Supporting Courses for the Option (14-16 cr.) Select from department list in consultation with adviser				Humanities (6 cr. GH)							
Additional Courses for the Major (15-17 cr.)								Social and Behavioral Sciences (6 cr. GS) 3 and ECON 002 GS, 004 GS, or 014 GS							
	CMPSC 101, 103, 201C, 201F or 203	3-4										United States Cultures (3 cr. US)			
	ECON 002, 004, 014	3										3			
	ENGL 202C or 202D	3										International Cultures (3 cr. IL)			
	ENGL 215 or CAS 211	3		3											
	STAT 200, 240, 250, or 301	3-4		First-Year Seminar (1-3 cr.) Health and Physical Education (3 cr. GHA)											
Elective (2-6 cr.)															
* Courses requiring at least a C grade. A minimum cumulative GPA of 2.00 is required for graduation. 05/09															

Academic Planning Notes

Academic Planning Notes

Minors Offered by the School of Forest Resources

The School of Forest Resources provides non-majors the opportunity to minor in Forest Science, Wildlife and Fisheries Science, or Wood Products Marketing. The requirements for each minor are listed below. **A grade of C or better is required for all courses in a minor.**

Forest Science Minor

The Forest Science minor is offered for students who wish to seek employment or achieve a basic competency in forestry without qualifying as professional foresters.

Students must complete 14 credits in Prescribed Courses and 6 or more credits selected from applied fields of study.

Prescribed Courses (14 credits):

- | | |
|-------------|---------------------------------|
| FOR 203 (3) | - Field Dendrology |
| W P 203 (1) | - Anatomical Properties of Wood |
| FOR 308 (3) | - Forest Ecology |
| FOR 366 (4) | - Forest Resources Measurements |
| FOR 421 (3) | - Silviculture |

Students must also select at least 5 credits from the following list, of which 3 credits must be at the 400 level:

- | | |
|-------------|--|
| FOR 320 (2) | - Forest Fire Management |
| FOR 416 (3) | - Forest Recreation |
| FOR 430 (3) | - Conservation Biology |
| FOR 440 (3) | - Forest Economics and Finance |
| FOR 455 (3) | - Remote Sensing and Spatial Data Handling |
| FOR 470 (3) | - Watershed Management |
| FOR 475 (3) | - Principles of Forest Soils Management |
| FOR 480 (3) | - Policy and Administration |

Students may select other FOR courses by petition to the Forest Science faculty

Wildlife and Fisheries Science Minor

The Wildlife and Fisheries Science minor provides non-majors with an introduction to the principles and practices of wildlife and fisheries conservation, research, and management.

Student must complete a minimum of 18 credits from the following list to complete the minor:

Prescribed Courses (6 credits):

- | | |
|---------------|---------------------------------------|
| W F S 209 (3) | - Wildlife and Fisheries Conservation |
| W F S 430 (3) | - Conservation Biology |

Students must select a minimum of 12 credits from the following additional courses:

* Please note the 2 credit classes; students must select a minimum of 12 credits

- W F S 300 (2)* - The Vertebrates
- W F S 407 (3) - Ornithology
- W F S 408 (3) - Mammalogy
- W F S 410 (3) - General Fishery Science
- W F S 422 (3) - Ecology of Fishes
- W F S 440 (3) - Natural Resources Public Relations
- W F S 447W (3) - Wildlife Management
- W F S/ E R M 450 (3)- Wetland Conservation
- W F S 452 (2)* - Ichthyology
- W F S 463W (3) - Fishery Management
- W F S 460 (3) - Wildlife Behavior

Students may select other W F S courses by petition to the W F S faculty

Wood Products Marketing Minor

The Wood Products Marketing minor offers students in other majors, especially those oriented toward business, science, or engineering, an opportunity to develop a basic competency in wood products marketing and processing. Students will obtain knowledge and skills particularly helpful for those who wish to seek employment in sales, to specify wood-based materials for construction and design, or in other related fields in the wood products industries.

Students must complete 15 credits in Prescribed Courses and 3 or more credits in additional Wood Products courses, for a minimum total of 18 credits.

Prescribed Courses (15 Credits):

- W P 411 (4) - Wood-Environmental Relationships
- W P 417 (4) - Wood Products Manufacturing Systems & Processes
- W P 435 (3) - Wood Products Production and Sales Management
- W P 437W (4) - Wood Industries Marketing Management

Students must also select 3 credits from the following list:

- W P 200W (3) - Professional Careers in Forest Resources
- W P 203 (1) - Anatomical Properties of Wood
- W P 337 (2) - Wood Technology
- W P 411 (4) - Wood-Environmental Relationships
- W P 412 (3) - Wood in Structures
- W P 413 (3) - Chemistry of Wood
- W P 418 (4) - Chemical Processing of Wood
- W P 423 (2) - Deterioration and Protection of Wood Products
- W P 460 (3) - Wood Products Industrial Environmental Control
- W P 490 (1) - Wood Products Colloquium
- FOR 203 (3) - Field Dendrology

Graduation Requirements

Knowing about and completing degree requirements is the student's responsibility. The *Baccalaureate Degree Programs Bulletin* and *Policies and Rules: A Handbook for Students* include information for which the student is responsible. This Wood Products Handbook is intended to supplement, and not replace, these sources of information.

To graduate, a candidate must complete the course requirements for the candidate's major and:

1. Earn at least a C (2.00) cumulative grade-point average for all courses taken at the University and
2. Earn at least a C grade in each major course designated by the major as a C-required course (starred on checksheet and designated in the online course bulletin).

Study Abroad at the University of Freiburg

<http://www.sfr.cas.psu.edu/Students/Freiburg/>

School of Forest Resources students have the opportunity to participate in a study abroad program with the Albert-Ludwigs-Universität Freiburg (University of Freiburg) in Germany. Our programs include:

- German Forestry Tour – a biennial 10-day trip open to all School of Forest Resources juniors and seniors
- Semester or Year Abroad – open to Forest Science majors with a basic proficiency in the German language

German Forestry Tour (FOR 497; 3 credits)

The biennial 10-day German Forestry Tour is sponsored by the School of Forest Resources and University of Freiburg. Juniors and seniors in Forest Science, Wildlife and Fisheries Science, and Wood Products may apply for this unique opportunity to learn about forestry, conservation, and the German culture. This course may be used as a supporting course for the Forest Management and Forest Biology options and as an elective in the Urban Forestry, and Watershed Management options of the Forest Science program. No foreign language skill necessary. The next scheduled tour will be in the Spring of 2010.

Other Study Abroad Opportunities

As an undergraduate student in the College of Agricultural Sciences, you can find accessible and affordable study abroad opportunities. Staff in the Office of International Programs can help you put together the right program and identify financial support. Learn more at <http://international.cas.psu.edu/Default.htm>.

The Penn State University Education Abroad Office also offers help in planning an international experience. Penn State has more than 180 summer, semester and full-year programs in over 45 countries! Over 60 of these programs are either specially designed, semester-length programs or are reciprocal exchange programs with an international university. Education Abroad offers numerous other short-term, faculty-led programs. With all these options, it is possible for students in nearly any discipline to study abroad! A listing of these programs may be found at <http://www.international.psu.edu/>. In addition, Penn State accepts transfer credits from many other programs.

Graduate School

Admission to the School of Forest Resources Graduate Program

Graduate programs in Wood Products are designed to give students an in-depth understanding of topics related to:

(1) wood science and technology in general and (2) more specific knowledge related to such areas as engineering, materials science, manufacturing, operations research, chemistry, marketing, and organizational management. Graduate students generally apply their knowledge of wood science (and wood as a raw material) to specific research problems related to one of the areas above.

Most programs of study are strengthened by including appropriate courses offered by related departments. For example, Industrial Engineering, Marketing, Management, Psychology, etc. The School of Forest Resources offers students the opportunity to earn Ph.D., M.S., M.F.R., and M.Agr. degrees within the Forest Resources program.

Graduate students from the Penn State Wood Products program are able to command higher starting salaries and progress upward in their careers more quickly than those with only a bachelor's degree. Prospective graduate students are encouraged to discuss opportunities for graduate school with their W P adviser during their senior year in the program.

The objectives for students enrolled in the Master of Science and the Doctor of Philosophy degree programs are to gain proficiency in research, education, and scientific technology in Wood Products. If you are considering an academic career, it is strongly advised that you acquire your doctorate at a different institution from your previous degree.

The Master of Forest Resources is a professional degree program for training students in applying a variety of technical skills toward interpreting and resolving forest resource-related problems. It emphasizes analysis, synthesis, and applications of knowledge, as compared to the traditional research goals of M.S. and Ph.D. programs.

For admission, an applicant should have at least a 2.75 grade point average, at least a 3.00 junior-senior average, and courses that are basic to the individual's field of specialization. Ordinarily these include 12 credits in communication; 12 credits in social sciences, arts, and humanities; 12 credits in quantification, including calculus, statistics, and computer sciences; 8 credits in physical sciences; 8 credits in biological sciences, and 18 credits in forestry or related courses. Graduate Record Examination (GRE) scores, three reference letters, and a brief statement describing the applicant's academic goals, career interests, and special qualifications are required. Exceptions to

admission requirements may be made for students with special backgrounds, abilities, and interests.

Normally it takes about two years to complete the M.S., M.F.R., and M.Agr., and three or four years to complete the Ph.D. Applicants with some deficiencies may be admitted but will need more time to satisfy degree requirements.

Suggestions for Applying to Graduate School

1. Apply early—November/December. Sometimes early decisions will be made on a project before the majority of applicants have applied.
2. To focus your list of schools, use the Internet, university catalogs (often on the Internet), specific position announcements, faculty contacts, and listings of faculty interests available from many departments.
3. Well-written letters of inquiry, including a resume, can be sent to specific faculty members or departments before you officially apply. Letters should have the following characteristics: typed neatly, well-edited, properly addressed, informative - why you want to attend graduate school; several specific and general areas of research interest; advertise particular skills that may be of interest to a given faculty member or department.
4. Learn something about your particular research interests and the faculty who work in that area by reviewing the literature, particularly Science Citation Index.
5. Only apply officially if you are sincerely interested. Do not waste peoples' time or your money. Get applications and related transcripts, GRE scores, etc. in on time. Plan ahead. Ask permission to use people as references. Inform them early if they have to write a letter of recommendation.
6. Your application materials are generally your only form of representation, so take the time and do it right.
7. After sufficient time has passed, request the status of your application, but do not be annoying. If you do not have any offers by spring, keep in touch with Penn State Wood Products faculty who may hear from colleagues about positions that become available in the summer.
8. Funding is desirable, but consider "proving" yourself for a semester in hopes of finding a project that becomes available later.

SWST Accreditation

The Society of Wood Science and Technology (SWST) grants accreditation only to specific educational curricula that lead to a first professional degree in wood science and technology or forest products at the bachelor's or master's level. Our Wood Products degree program is accredited. The SWST maintains a list of accredited institutions on their Web site at <http://www.swst.org/schooldirectory.html>. These institutions offer curricula that have been found to meet minimum standards for objectives, curriculum, faculty, students, administration, parent-institution support, and physical resources and facilities.

Course Descriptions

*A complete list of undergraduate course descriptions may be found at [http://www.psu.edu/bulletins/bluebook/\\$crmenu.htm](http://www.psu.edu/bulletins/bluebook/$crmenu.htm).

ACCTG 211. FINANCIAL AND MANAGERIAL ACCOUNTING FOR DECISION MAKING (4) Introduction to the role of accounting numbers in the process of managing a business and in investor decision-making.

AG BM 101 GS. ECONOMIC PRINCIPLES OF AGRIBUSINESS DECISION MAKING (3) Introduction to economic principles and their application to real world examples of agribusiness management issues.

AG EC 350. INTERNATIONAL AGRICULTURAL TRADE (3) The economics of international agricultural trade, agricultural trade policy. Prerequisite: ECON 002.

B A 250. SMALL BUSINESS MANAGEMENT (3) Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.

B LAW 243. LEGAL ENVIRONMENT OF BUSINESS (3) Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. May not be used to satisfy Smeal College baccalaureate degree requirements. Not available to students who have taken B A 243. Prerequisite: third-semester standing.

SCM 301. BUSINESS LOGISTICS MANAGEMENT (3) Management of logistics/supply chain processes. Prerequisite: 3 credits each in mathematics and English; CMPSC 203 or equivalent; not available to baccalaureate business students in Smeal College.

CAS 100 GWS. EFFECTIVE SPEECH (3) Introduction to speech communication, formal speaking, group discussion, analysis and evaluation of messages. FOR majors may take CAS 100A, 100B, or 100C.

CAS 211. INFORMATIVE SPEAKING (3) Planning, organizing, adapting, and presenting informative speeches and oral reports on technical and scholarly projects, both by manuscript reading and extemporaneously. Prerequisite: CAS 100.

CHEM 110 (formerly 012) GN. CHEMICAL PRINCIPLES I (3) Basic concepts and quantitative relations. The following combinations of courses must be taken to receive General Education credit in chemistry: CHEM 110 GN (or CHEM 017 GN) and CHEM 111 GN; CHEM 112 GN and CHEM 113 GN. Prerequisite: satisfactory performance on the Chemistry and Math FTCAP tests-- i.e., placement beyond the level of CHEM 011 and MATH 022; or CHEM 011, and MATH 022 or MATH 041.

CHEM 112 (formerly 013) GN. CHEMICAL PRINCIPLES II (3) Continuation of CHEM 110, including an introduction to the chemistry of the elements. The following combinations of courses must be taken to receive General Education credit in chemistry: CHEM 110 GN (or CHEM 017 GN) and CHEM 111 GN; CHEM 112 GN and CHEM 113 GN. Prerequisite: CHEM 110 or CHEM 106. Prerequisite or concurrent: CHEM 111 .

CHEM 111 (formerly 014) GN. EXPERIMENTAL CHEMISTRY I (1) Introduction to quantitative experimentation in chemistry. The following combinations of courses must be taken to receive General Education credit in chemistry: CHEM 110 GN (or CHEM 017 GN) and CHEM 111 GN; CHEM 112 GN and CHEM 113 GN. Prerequisite or concurrent: CHEM 110 or CHEM 106.

CMPSC 101 GQ. INTRODUCTION TO C++ PROGRAMMING (3) Properties of algorithms, languages, and notations for describing algorithms, applications of a procedure-oriented language to problem solving. A student may receive credit for only one of the following courses: CMPSC 101, 201C, 201F, CSE 103. Prerequisite: 2 entrance units in mathematics.

ECON 002 GS. INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY (3) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.

ECON 004 GS. INTRODUCTORY MACROECONOMICS ANALYSIS AND POLICY (3) National income measurement; aggregate economic models; money and income; policy problems.

ECON 014 GS. PRINCIPLES OF ECONOMICS (3) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 or 004 or are registered in the College of Business Administration may not schedule this course.

ECON 315 GS. LABOR ECONOMICS (3) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002.

ECON 333 GS. INTERNATIONAL ECONOMICS (3) Why nations trade, barriers to trade, balance of payments adjustment and exchange rate determination, Eurocurrency markets, and trade-related institutions. Prerequisite: ECON 002, 004, or 014.

ENGL 015 GWS. RHETORIC AND COMPOSITION (3) Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.

ENGL 202C GWS. EFFECTIVE WRITING: TECHNICAL WRITING (3) Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D.) Prerequisites: ENGL 015 GWS or 030 GWS; fourth-semester standing.

ENGL 202D GWS. EFFECTIVE WRITING: BUSINESS WRITING (3) Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D.) Prerequisites: ENGL 015 GWS or 030 GWS; fourth-semester standing.

ENGL 215. INTRODUCTION TO ARTICLE WRITING (3) Written exercises in, and a study of, the principles of article writing; practice in the writing of scientific articles. Prerequisite: ENGL 015 or 030.

FIN 100. INTRODUCTION TO FINANCE (3) The nature, scope, and interdependence of the institutional and individual participants in the financial system. May not be used to satisfy Smeal College baccalaureate degree requirements. A student may not receive credit toward graduation for both FIN 100 and 301, or for both FIN 100 and B A 301. Prerequisite: third-semester standing.

FOR 203. FIELD DENDROLOGY (2) Field and laboratory identification of native and introduced trees and shrubs by leaf, fruit, twig, and bark. Concurrent: FOR/WP 200W and W P 203.

I B 303. INTERNATIONAL BUSINESS OPERATIONS (3) A survey of the major aspects of international business environment and operations with an emphasis on the cultural dimension. Prerequisite: fifth-semester standing.

LER 100 GS. INDUSTRIAL RELATIONS (3) Introductory analysis of the employment relationship and of the interrelated interests of management, workers, unions, and the public.

MATH 110 GQ. TECHNIQUES OF CALCULUS I (4) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may only take one course for credit from MATH 110, 140, 140A, and 140B. Prerequisite: MATH 022 or satisfactory performance on proficiency examination.

MATH 111 GQ. TECHNIQUES OF CALCULUS II (2) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110.

MGMT 100. SURVEY OF MANAGEMENT (3) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change. May not be used to satisfy Smeal College baccalaureate degree requirements. Not available to students who have taken B A 304 or MGMT 301.

MKTG 221. CONTEMPORARY AMERICAN MARKETING (3) Social and economic aspects, movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301, or for both B A 303 and MKTG 221. May not be used to satisfy Smeal College baccalaureate degree requirements. Prerequisite: 3 credits in economics.

PSYCH 002 GS. INTRODUCTORY PSYCHOLOGY (3) Introduction to general psychology; principles of human behavior and their applications.

STAT 200 GQ. ELEMENTARY STATISTICS (4) Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.

STAT 240. INTRODUCTION TO BIOMETRY (3) Statistical analysis, sampling, and experimentation in the agricultural sciences; data collection, descriptive statistics, statistical inference, regression, one factor AOV, probability. Students may take only one course from STAT 200, 220, 240, 250 for credit. Prerequisite: 3 credits in mathematics.

STAT 250 GQ. INTRODUCTION TO BIostatISTICS (3) Statistical analysis and interpretation of data in the biological sciences; probability; distributions; statistical inference for one- and two-sample problems. Prerequisite: 3 credits in mathematics.

STAT 301 GQ. STATISTICAL ANALYSIS I (3) Probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses. Prerequisite: 3 credits of calculus.

W P/FOR 200W. PROFESSIONAL CAREERS IN FOREST RESOURCES (3) Introduction to managing forests for products and services to meet human needs; developing career goals and an academic plan. Concurrent: WP 203

W P 203. ANATOMICAL PROPERTIES OF WOOD (1) Information on tree form and growth, cell wall formation and composition, and structure of wood and bark cells. Macroscopic and microscopic identification of hardwood and softwood cells. Concurrent: FOR/WP 200W and FOR 203.

W P 337. WOOD TECHNOLOGY (2) An introduction to forest tree structure, function, and growth, and the identification of important commercial hardwoods and softwoods. Prerequisite: W P 203.

W P 400. PROPERTIES OF WOOD (2) Chemical and mechanical properties of wood and wood composites. Prerequisite: W P 200W. (May not be taken by students in the WP Processing and Manufacturing option.)

W P 411. WOOD-ENVIRONMENTAL RELATIONSHIPS (4) Material composition and structure; basic and derived physical properties; moisture movement in wood; methods and techniques of drying wood. Prerequisite or concurrent: W P 200W, W P 203.

W P 412. WOOD IN STRUCTURES (3) Behavior and design of solid, laminated, and plywood beams, trusses, columns, and foundations. Wood construction details. Prerequisite: W P 200W, W P 203.

W P 413. THE CHEMISTRY OF WOOD (3). Chemical composition, reactions, and properties in relation to products and the uses of wood. Prerequisites: W P 200W, W P 203.

- W P 416. WOOD INDUSTRIES MANAGEMENT DEVELOPMENT (3) Managerial concepts and issues important to forest products organizations will help prepare students to assume management-level positions. Prerequisite: W P 200W.
- W P 417. WOOD PRODUCTS MANUFACTURING SYSTEMS AND PROCESSES (4) Description of systems and processes used in the manufacture of wood products. Prerequisites: W P 200W, W P 203, sixth-semester standing.
- W P 418. CHEMICAL PROCESSING OF WOOD (4) Principles and practices of basic operations in converting wood and wood waste into useful chemicals and modified cellulose products. Prerequisite: W P 200W, W P 203.
- W P 423. DETERIORATION AND PROTECTION OF WOOD PRODUCTS (2) Timber and wood deterioration from fungi, insects, fire; treatment of wood products for protection. Prerequisite: W P 203.
- W P 435. WOOD PRODUCTS PRODUCTION AND SALES MANAGEMENT (3) Wood products production management with emphasis on investment decision-making, personal selling, and sales management. Prerequisite: W P 200W.
- W P 437W. WOOD INDUSTRIES MARKETING MANAGEMENT (4) Examination of major international wood products market segments in terms of products, distribution, industry structure, and strategic management issues. Prerequisite: W P 200W, W P 203.
- W P 438 BUSINESS CONCEPTS FOR WOOD MANUFACTURING (4) The course will cover manufacturing strategies and related financial measures in a wood production environment. Prerequisite: W P 200W
- W P 460. WOOD PRODUCTS INDUSTRIAL ENVIRONMENTAL CONTROL (3) Wood products industrial environmental control technologies and strategies for pollution abatement. Prerequisite: fifth-semester standing.
- W P 490. WOOD PRODUCTS COLLOQUIUM (1) Presentations and discussion of solutions to problems within the wood products industry. Prerequisite: seventh-semester standing.
- W P 495. WOOD PRODUCTS INTERNSHIP (1-6) Supervised field experience related to the student's major. Prerequisite: Approval of proposed assignment by instructor prior to registration.
- W P 496. INDEPENDENT STUDIES (1-18)
- W P 497 SPECIAL TOPICS (1-9)
- W P 499 (IL) FOREIGN STUDIES (1-12 per semester)

School of Forest Resources Course Offerings by Semester at University Park

These offerings are subject to change as circumstances require

Course	Title (cr.)	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013
FOR 200W	Careers in For Resources (3)	X		X		X		X	
FOR 203	Field Dendrology (3)	X		X		X		X	
FOR 204	Dendrology (2)		X		X		X		X
FOR 308	Forest Ecology (3)	X		X		X		X	
FOR 320	Forest Fire Mgmt (2)		X		X		X		X
FOR 339	Timber Harvesting (3)								
FOR 350	For Resources Biometrics (3)		X		X		X		X
FOR 366	For Res Measurements (4)		X		X		X		X
FOR 401	Urban Forest Mgmt (3)	X		X		X		X	
FOR 409	Tree Physiology (2)				X				X
FOR 410	Forest Ecosystem Mgmt (3)		X		X		X		X
FOR 416	Forest Recreation (3)	X		X		X		X	
FOR 418	Agroforestry (3)		X				X		
FOR 421	Silviculture (3)	X		X		X		X	
FOR/W F S 430	Conservation Biology (3)	X		X		X		X	
FOR 440	Forest Econ & Finance (3)		X		X		X		X
FOR 455	Rem Sens & Spa Dat (3)	X		X		X		X	
FOR 466W	For Resource Mgmt (3)		X		X		X		X
FOR 470	Watershed Management (3)		X		X		X		X
FOR 471	Watershed Mgmt Lab (1)		X		X		X		X
FOR 475	Forest Soils Mgmt (3)		X		X		X		X
FOR 480	Policy & Administration (3)	X		X		X		X	
FOR 485	Natural Resource Decisions (3)								
FOR 488Y	International Forestry (3)				X				X
FOR 496A	Nat Res GIS – 1	X	X	X	X	X	X	X	X
FOR 496B	Nat Res GIS – 2	X	X	X	X	X	X	X	X
FOR 497A	German Forest Tour				X				X
FOR 508	Forest Ecology (3)		X				X		
FOR 517	Forest Microclimatology (3)								
FOR 518	Hydrologic Measurements (2)								
FOR 519	Forest Hydrology (3)								
FOR 520	Snow Hydrology (2)								
FOR 521	Advanced Silviculture (3)		X		X		X		X
FOR 530	Conservation Genetics		X				X		
FOR 550	Mltvar Anal For Res (3)								
FOR 555	Multispec Rem Sens (3)								
FOR 570	Watershed Stwd. Prac. I (3)	X		X		X		X	
FOR 571	Watershed Stwd. Prac. II (5)		X		X		X		X
FOR/W F S 590	Colloquium (1)	X	X	X	X	X	X	X	X
FOR 591A	Watershed Issues Seminar (1)	X		X		X		X	
FOR 591B	Watershed Planning Seminar (1)		X		X		X		X
W F S 209	Wild/Fish Conservation (3)	X	X	X	X	X	X	X	X
W F S 300	The Vertebrates (2)			X		X		X	
W F S 301	Vertebrate Laboratory (2)	X		X		X		X	
W F S 310	W F S Measurements (3)	X		X		X		X	
W F S 406	Ornithology Lab (1)		X		X		X		X

Course	Title (cr.)	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013
W F S 407	Ornithology (3)		X		X		X		X
W F S 408	Mammalogy (3)		X		X		X		X
W F S 409	Mammalogy Lab (1)		X		X		X		X
W F S 410	Fisheries Science (3)	X		X		X		X	
W F S 422	Ecology of Fish (3)			X				X	
W F S 424	Aquaculture (2)								
W F S/FOR 430	Conservation Biology (3)	X		X		X		X	
W F S/E R M 435	Limnology (3)	X		X		X		X	
W F S 440	NatRes Public Relations (3)		X		X		X		X
W F S 446	Wildl Fish Pop Dyn (3)		X		X		X		X
W F S 447W	Wildl Management (3)	X		X		X		X	
W F S/E R M 450	Wetlands Conservation (3)	X		X		X		X	
W F S 452	Ichthyology (2)	X		X		X		X	
WFS 460	Wildlife Behavior (3)		X		X		X		X
W F S 462	Amphibians and Reptiles (3)	X		X		X		X	
W F S 453	Ichthyology Lab (2)	X		X		X		X	
W F S 463W	Fishery Management (3)		X		X		X		X
W F S 500	Professionalism in Nat. Res. (3)	X		X		X		X	
W F S 529	Fish Pop Dynam (3)								
W F S 525	Comm in Natural Resources (3)								
W F S 530	Conservation Ecology (3)			X				X	
W F S 536	Freshwater Field Ecology (3)								
W F S 542	Systematics (3)	X				X			
W F S 551	Wildl Biometrics (3)		X				X		
W F S 552	Syst & Evol Fish (3)	X				X			
W F S 560	Population Estimation (4)								
W F S/FOR 590	Colloquium (1)	X	X	X	X	X	X	X	X
W P 200W	Careers in Forest Res (3)	X		X		X		X	
W P 203	Anatomical Prop Wd (1)	X		X		X		X	
W P 337	Wood Technology (2)		X				X		
W P 400	Properties of Wood (3)				X				X
W P 411	Wood-Environ Relations (4)			X		X		X	
W P 412	Wood in Structures (3)				X				X
W P 413	Chemistry of Wood (4)	X				X			
W P 416	Wood Industries Mgt Dev (3)	X				X			
W P 417	W P Mfr Sys and Proc (4)		X				X		
W P 418	Chem Proc of Wood (4)	X		X		X			
W P 423	Deterior and Protect (2)				X				X
W P 435	W P Prod Mgmt (3)				X				X
W P 437W	Wood Ind Mktg Mgmt (4)		X				X		
W P 438	Bus Concepts in Wood Mfg (4)			X				X	
W P 460	W P Ind Envir Ctrl (3)								
W P 490	W P Colloquium (1)				X				X
W P 502	Wood Fibers (3)								
W P 511	Phys Prop Wood & Fiber (3)								
W P 513	Wood Chemistry (3)	X				X			
W P 515	Wood Comp Proc Para (3)		X				X		

Course	Title (cr.)	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013
W P 530	W P Indl Mktg Mgmt (3)		X				X		
W P 531	Mchl Behav Wood (3)								
W P 532	Theory of Adhesion (3)				X				X
W P 537	Intl WP Mktg and Trade (3)				X				X
W P 560	W P Industry Environ. Control (3)								
W P 590	Colloquium (1)	X	X	X	X	X	X	X	X

Wood Products Faculty

Director of the School of Forest Resources

MESSINA, MICHAEL ~ Director of the School of Forest Resources

Interests: Silviculture, Forest Ecology
Degree: Ph.D., North Carolina State University (1983)
Office: 121 Forest Resources Building
Phone: (814) 865-7093
E-mail: mgm20@psu.edu

Chair, Wood Products Faculty

RAY, CHARLES ~ Associate Professor of Wood Products Operations

Interests: Manufacturing improvement, operations research
Degree: Ph.D., Texas A&M University (1991)
Office: 205 Forest Resources Building
Phone: (814) 865-0679
E-mail: cdr14@psu.edu

BROWN, NICOLE ~ Associate Professor of Wood Chemistry

Interests: Wood composites, adhesives, coatings, other treatments of lignocellulosics
Degree: Ph.D., Virginia Polytechnic Institute and State University (2004)
Office: 202 Forest Resources Building
Phone: (814) 865-7423
E-mail: nrb10@psu.edu

JANOWIAK, JOHN J. ~ Professor of Forest Products

Interests: Wood composite and solid lumber products
Degree: Ph.D., Washington State University (1989)
Office: 307 Forest Resources Lab
Phone: (814) 865-3916
E-mail: jjj2@psu.edu

MICHAEL, JUDD ~ Professor, Wood Products Business Management

Interests: Wood products business management, organizational behavior
Degree: Ph.D., The Pennsylvania State University (1994)

Office: 211 Forest Resources Building
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