

FOREST ENGINEERING UNDERGRADUATE MAJOR (BS, HBS)

The Forest Engineering Undergraduate Program provides an engineering education within a strong forestry context. The program is founded on fundamental principles of forest science and engineering science. Forest Engineering program objectives are to prepare graduates to plan and implement complex forestry and natural resource operations that help meet global demands for wood products while sustaining water, habitat, and other forest resources. It provides "work-ready" graduates for entry into the diverse professional field of forest engineering. Early career accomplishments include harvest unit design, forest road location and design, contract inspection and administration, cost analysis, and forest transportation management. Mid-career accomplishments commonly expand to involve aspects of engineering management, including planning and budgeting, supervision, wood supply procurement, harvest and road design reviews, and scheduling and controlling forest operations.

Program Educational Objectives – Forest Engineering

Specifically, the Forest Engineering Undergraduate Program provides fundamental coverage of the following:

- Fundamental engineering and forestry principles
- Physical and biological aspects of soil and water resources
- Surveying and measurement of land and forest resources
- Analysis and design of the forest transportation system
- Analysis and design of harvesting operations
- Economics and operational planning principles

Integration of these topics enables forest engineering graduates to develop and manage safe, economical, and environmentally sound forest operations. Design experiences that integrate the topics listed above and steadily build on previous course material are distributed throughout the upper-division portion of the program. The Forest Engineering capstone sequence during the senior year provides an opportunity for students to bring together all the topics from the curriculum in a project framework that includes the field and office engineering tasks associated with the planning and design of forest operations. The capstone sequence is integrated with the Forestry capstone sequence to provide realistic interdisciplinary planning and design experience.

Forest engineering graduates are employed by private forestry firms, public forestry agencies, logging and construction companies, engineering consulting firms, and surveying firms. Some graduates establish their own consulting businesses after a few years of field experience. Career progression following graduation can be quite varied. Some graduates gravitate toward technical positions while others move quickly toward management of harvesting and other forest operations, or more broadly defined management of the forest land base.

The Bachelor of Science and Honors Bachelor of Science degrees in Forest Engineering can be earned through completion of the Forest Engineering program or the Forest Engineering-Civil Engineering double degree program. The BS and HBS degrees in Forest Engineering and the BS and HBS Forest Engineering-Civil Engineering dual degrees are accredited by the Engineering Accreditation Commission of ABET, [http://](http://www.ABET.org)

www.ABET.org. The BS in Forest Engineering is also accredited by the Society of American Foresters.

Completion of the five-year, double-degree Forest Engineering-Civil Engineering program results in a BS in Forest Engineering and a BS in Civil Engineering, offered by the School of Civil and Construction Engineering. The BS and HBS degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.ABET.org>. A more detailed explanation of the design experience and design course sequences is contained in the "Forest Engineering Advising Guide," which may be viewed on the department's website (https://www.forestry.oregonstate.edu/sites/default/files/upload_files/FE%20Advising%20Guide%2019%2020.pdf).

Forest engineering is a licensed profession in the state of Oregon. The BS in Forest Engineering meets the administrative rules established by the Oregon State Board of Examiners for Engineering and Land Surveying (OSBEELS) as evidence of adequate preparation for the Fundamentals of Engineering Examination, the first of two examinations required for professional engineering licensing. The BS in Forest Engineering, with the completion of appropriate program electives, also meets the OSBEELS administrative rules for evidence of adequate preparation for the Fundamentals of Land Surveying Examination, the first of two examinations required for professional land surveyor licensing.

Major Code: 380

Pre-Forest Engineering Major Code: 825

- Develop engineered forest operations that achieve silvicultural objectives.
- Develop engineered forest operations that appropriately protect soil and water resources.
- Survey and measure land and forest resources so that the engineering tasks associated with Forest Land Management, specifically, the design of appropriate Forest Operations can be effectively completed.
- Provide designs and manage the forest transportation in a way that meets the needs of forest land management and minimizes environmental impact.
- Plan and manage safe, economic and environmentally sound forest operations.
- Incorporate long term forest land management and operational planning in an environmental and economic context into forest operation plans.

Grade standards for the professional program as listed in the program description apply.

All students pursuing the BS in Forest Engineering:

1. must earn grades of "C" or better in all courses required for the major;
2. must maintain a 2.0 GPA in all courses required for the major.
3. Must accrue a minimum of 192 total credits required for graduation.

First Year		Credits
Pre-Forest Engineering		
CH 201	CHEMISTRY FOR ENGINEERING MAJORS ^{1,2}	3
COMM 111 or COMM 114	*PUBLIC SPEAKING ^{1,2} or *ARGUMENT AND CRITICAL DISCOURSE	3
ECON 201	*INTRODUCTION TO MICROECONOMICS ^{1,2}	4
FE 101	INTRODUCTION TO FOREST ENGINEERING ²	2

2 Forest Engineering Undergraduate Major (BS, HBS)

FE 102	FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY ²	3
FOR 111	INTRODUCTION TO FORESTRY ²	3
FES 240	*FOREST BIOLOGY ^{1,2}	4
HHS 231	*LIFETIME FITNESS FOR HEALTH ¹	2
HHS 241	*LIFETIME FITNESS (or any PAC course) ¹	1-2
MTH 251	*DIFFERENTIAL CALCULUS ^{1,2}	4
MTH 252	INTEGRAL CALCULUS ²	4
MTH 254	VECTOR CALCULUS I ²	4
PH 211	*GENERAL PHYSICS WITH CALCULUS ^{1,2}	4
WR 121	*ENGLISH COMPOSITION ^{1,2}	3
Electives		3
Credits		47-48

Second Year

CCE 201	CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN ²	3
ENGR 211	STATICS ²	3
ENGR 212	DYNAMICS ²	3
ENGR 213	STRENGTH OF MATERIALS ²	3
FE 208	FOREST SURVEYING ²	4
FE 257	GIS AND FOREST ENGINEERING APPLICATIONS ²	3
FES 241	DENDROLOGY ²	3
MTH 256	APPLIED DIFFERENTIAL EQUATIONS ²	4
PH 212	*GENERAL PHYSICS WITH CALCULUS ^{1,2}	4
SOIL 205	SOIL SCIENCE	3
FOR 206	*FOREST SOILS LABORATORY FOR SOIL 205 ^{1,2}	1
ST 201	PRINCIPLES OF STATISTICS ²	4
WR 327	*TECHNICAL WRITING ^{1,2}	3
Bacc Core Courses		6
Electives		2
Credits		49

Third Year

Professional Forest Engineering		
FE 310	FOREST ROUTE SURVEYING	4
FE 312/FOR 312	FORESTRY FIELD SCHOOL	2
FE 315	SOIL ENGINEERING	4
FE 316	SOIL MECHANICS	4
FE 330	FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS	3
FE 371	HARVESTING PROCESS ENGINEERING	4
FE 434	FOREST WATERSHED MANAGEMENT	4
FE 440	FOREST OPERATIONS ANALYSIS	4
FE 470	LOGGING MECHANICS	4
FE 471	HARVESTING MANAGEMENT	3
FOR 321	FOREST MENSURATION	5
FOR 329	FOREST RESOURCE ECONOMICS I	4
FOR 441	SILVICULTURE PRINCIPLES	4
Bacc Core Course		3
Credits		52

Fourth Year

FE 415	FOREST ROAD ENGINEERING	3
FE 416	FOREST ROAD SYSTEM MANAGEMENT	4
FE 444	FOREST REMOTE SENSING AND PHOTOGRAMMETRY	4
FE 457/FOR 457	TECHNIQUES FOR FOREST RESOURCE ANALYSIS	4
FE 459/FOR 459	FOREST MANAGEMENT PLANNING AND DESIGN I	4
FE 460 or FOR 460	*FOREST OPERATIONS REGULATIONS AND POLICY ISSUES or *FOREST POLICY	3-4
FE 469/FOR 469	FOREST MANAGEMENT PLANNING AND DESIGN II	4
FE 480	FOREST ENGINEERING PRACTICE AND PROFESSIONALISM	1
FOR 330	FOREST RESOURCE ECONOMICS II	4

GEOG 300 or FW 350	*SUSTAINABILITY FOR THE COMMON GOOD ² or *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY	3
Bacc Core Courses		6
Electives		4
Credits		44-45
Total Credits		192-194

*

Baccalaureate Core Course (BCC)

^

Writing Intensive Course (WIC)

1

Must be selected to satisfy baccalaureate core requirements

2

Required for entry into the professional program

Major Code: 380

Pre-Forest Engineering Major Code: 825

First Year

Fall		Credits
CH 201	CHEMISTRY FOR ENGINEERING MAJORS	3
FE 101	INTRODUCTION TO FOREST ENGINEERING	2
FOR 111	INTRODUCTION TO FORESTRY	3
MTH 251	*DIFFERENTIAL CALCULUS	4
WR 121	*ENGLISH COMPOSITION	3
Credits		15

Winter

ECON 201	*INTRODUCTION TO MICROECONOMICS	4
FE 102	FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY	3
HHS 231	*LIFETIME FITNESS FOR HEALTH	2
HHS 241	*LIFETIME FITNESS (or any PAC course)	1-2
MTH 252	INTEGRAL CALCULUS	4
Elective		2
Credits		16-17

Spring

COMM 111 or COMM 114	*PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE	3
FES 240	*FOREST BIOLOGY	4
MTH 254	VECTOR CALCULUS I	4
PH 211	*GENERAL PHYSICS WITH CALCULUS	4
Elective		1
Credits		16

Second Year

Fall

ENGR 211	STATICS	3
FE 208	FOREST SURVEYING	4
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
PH 212	*GENERAL PHYSICS WITH CALCULUS	4
Electives		2
Credits		17

Winter

CCE 201	CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN	3
ENGR 213	STRENGTH OF MATERIALS	3
FE 257	GIS AND FOREST ENGINEERING APPLICATIONS	3
ST 201	PRINCIPLES OF STATISTICS	4
Bacc Core Course		3
Credits		16

Spring		
ENGR 212	DYNAMICS	3
FES 241	DENDROLOGY	3
SOIL 205	SOIL SCIENCE	3
WR 327	*TECHNICAL WRITING	3
Bacc Core Course		3
FOR 206	*FOREST SOILS LABORATORY FOR SOIL 205	1
Credits		16
Third Year		
Fall		
FE 312/FOR 312	FORESTRY FIELD SCHOOL	2
FE 330	FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS	3
FE 371	HARVESTING PROCESS ENGINEERING	4
FE 434	FOREST WATERSHED MANAGEMENT	4
FOR 321	FOREST MENSURATION	5
Credits		18
Winter		
FE 315	SOIL ENGINEERING	4
FE 440	FOREST OPERATIONS ANALYSIS	4
FE 470	LOGGING MECHANICS	4
FOR 329	FOREST RESOURCE ECONOMICS I	4
Credits		16
Spring		
FE 310	FOREST ROUTE SURVEYING	4
FE 316	SOIL MECHANICS	4
FE 471	HARVESTING MANAGEMENT	3
FOR 441	SILVICULTURE PRINCIPLES	4
Bacc Core Course		3
Credits		18
Fourth Year		
Fall		
FE 444	FOREST REMOTE SENSING AND PHOTOGRAMMETRY	4
FE 457/FOR 457	TECHNIQUES FOR FOREST RESOURCE ANALYSIS	4
FE 460 or FOR 460	*FOREST OPERATIONS REGULATIONS AND POLICY ISSUES or *FOREST POLICY	3-4
FOR 330	FOREST RESOURCE ECONOMICS II	4
Credits		15-16
Winter		
FE 415	FOREST ROAD ENGINEERING	3
FE 459/FOR 459	FOREST MANAGEMENT PLANNING AND DESIGN I	4
FE 480	FOREST ENGINEERING PRACTICE AND PROFESSIONALISM	1
GEOG 300 or FW 350	*SUSTAINABILITY FOR THE COMMON GOOD or *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY	3
Elective		4
Credits		15
Spring		
FE 416	FOREST ROAD SYSTEM MANAGEMENT	4
FE 469/FOR 469	FOREST MANAGEMENT PLANNING AND DESIGN II	4
Bacc Core Courses		6
Credits		14
Total Credits		192-194

*
Baccalaureate Core Course (BCC)

^
Writing Intensive Course (WIC)