This presentation should

- Introduce the Bioresource Science and Engineering (BSE) program
- Discuss the opportunities a BSE degree presents
- Explain the relationship to the Washington Pulp and Paper Foundation
- Present available resources: Scholarships, info. sessions, internships, lab assistance
- Provide a path to obtain more information
BSE Program Objective

- Develop process engineers who optimize the sustainable manufacture of value added materials, e.g. pulp, paper, fuels, and chemicals from renewable resources
Identify and characterize the components of various bioresource raw materials

Separate the potentially valuable components into building blocks using different pathways, e.g. chemical, biological, thermal.

Modify and combine the building blocks into valuable products

Carbohydrates
  Carbon
  Lignin

Hemi-cellulose
  Fiber
  Cellulose

Engineering & Chem E Fundamentals: Chemistry, math, physics, thermodynamics, fluid dynamics, mat’l & energy balances, process control……
BSE Program Objective

Bioresource → Conversion → Useful Stuff

- Biological conversion
- Chemical conversion
- Thermal conversion

Process Engineering, Economics, Environment, Social
BSE Program

Bioresource

Chemical Process Engineering Core

Fundamentals

Engineering Topics

Business Option

Enviro

5th Yr Chem E
BSE Program

- Fully **ABET** accredited engineering program
- Chemical **process engineering** core
- Complete education
  - Rigorous **technical** education
  - Emphasis on **communication**, teamwork and leadership skills
- Exceptional **scholarship** program
- Chemical engineering and business **options**
What you can do....

Primary Manufacturers
- Operations Supervision
- Process Optimization
- Environmental Engineering

Others
- Materials Engineer
- Graduate Research
- Law/Medicine

Chemical Companies
- Technical Service
- Product Development
- Sales Management

Engineering Firms
- Process Control
- Project Management
- Environmental Engineering
Where do BSE graduates work?

- Primary Manufacturers (39%)
- Suppliers to industry (23%)
- Consulting (12%)
- Graduate school (6%)
- Others (19%)

128 graduates over past 8 years
Where you can do it

Primary Manufacturers
- Domtar
- Georgia-Pacific
- International Paper

Chemical Companies
- Nalco
- Solenis
- FMC
- Ascensus

Process Engineers

Others
- Boeing
- Department of Defense
- Mars (Candy)
- Lundberg

Engineering Firms
- Harris Group
- Panther System
- Capstone
- Majiq
BSE Program

- Multiple career opportunities
  - 100% job placement
  - Starting salary - $75,000+
  - A path to supervision and management
- Challenging and well-paid intern and co-op experience
BSE Program

- BSE fits between chemical and environmental engineering
  - Process engineering with strong environmental focus
- Small classes with approachable faculty
- Hands on experience with pilot scale equipment
- Comprehensive capstone final
Wollenberg Paper and Bioresource Science Laboratory
Wollenberg Paper and Bioresource Science Laboratory
Biofuels and Bioproducts Lab
Nanomaterials from biomass:

- **Nanotube**: discovered in 1991
- **Graphene**: discovered in 2004 (Nobel 2010)

Extraordinary properties:

- **Dimensions**: 50,000 < human hair
- **20 g** of nanotubes cover a football field!
- **Strength**: stronger than steel
- **Conductivity**: better than copper

Large variety of applications:

- **Optoelectronics**: sensors, transistors
- **Environment**: catalysis, filters
- **Aerospace**: light-weight composites
- ...
WPPF and BSE: a Unique Relationship

- Began 50 years ago with more than 50 current members
- Paid internships, mentoring, path to full time employment
- Member companies hire >80% of our graduates
- Members provide feedback to the program
- No other relationship like ours at the UW
Washington Pulp and Paper Foundation Members
Student Internships
BSE Scholarships

- Awarded by
  - WPPF (Washington Pulp & Paper Foundation) and SEFS (School of Environmental and Forest Sciences)
- ~ 50 Scholarships are awarded (approx. 3/4 of students)
  - Total value can reach $30,000
- Criteria
  - Academic merit (primary)
  - Demonstrated leadership potential
- Apply to the WPPF before 1 April for consideration for fall award
And we have some fun!
# BSE: Where Else Can You Find…

## Education
- Fully accredited engineering degree?
- Department that helps pay for your education?
- Small class sizes - know your professors?
- Undergraduate research opportunities?
- Department that cares - place to call home?

## Jobs
- Good paying internship opportunities?
- Career counseling and placement assistance?
- Near 100% job placement?
- Diverse career options?
- Build a management career on a technical foundation?

If BSE sounds like it will fit your students, let’s talk and schedule a visit.
Wrap Up

- What was missed?
- Forward your questions to wppf@uw.edu
- Arrange a visit to our campus!
  - Meet current students and faculty
  - Talk with our undergraduate adviser
  - Tour the laboratories