



OFFICE OF THE PRESIDENT

June 3, 2010

Interim Dean Dennis Hartmann
College of the Environment
Box 355679

Dear Dennis:

Based on the recommendation of its Subcommittee on Admissions and Programs, the Faculty Council on Academic Standards has recommended approval of the program name change from Paper Science and Engineering to Bioresource Science and Engineering and the revised program requirements for the Bachelor of Science degree in Bioresource Science and Engineering. A copy of the changes is attached.

I am writing to inform you that the School of Forest Resources is authorized to specify these requirements beginning autumn quarter 2010.

The new requirements should be incorporated in printed statements and in individual department websites as soon as possible. The *General Catalog* website will be updated accordingly by the Registrar's Office.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Mark A. Emmert".

Mark A. Emmert
President

Enclosure

cc: Ms. Michelle Trudeau (with enclosure)
Mr. Robert Corbett (with enclosure)
Dr. Deborah H. Wiegand (with enclosure)
Mr. Todd Mildon, J.D. (with enclosure BSE-20100210)



UNIVERSITY OF WASHINGTON
CREATING AND CHANGING UNDERGRADUATE
ACADEMIC PROGRAMS

OFFICE USE ONLY
Control # BSF - 20100210

After college/school/campus review, send a signed original and 8 copies to the Curriculum Office/FCAS, Box 355850.

For information about when and how to use this form: <http://depts.washington.edu/uwcr/1503instructions.pdf>

College/Campus Environment/Seattle

Department/Unit School of Forest Resources

Date 10 Feb 2010

New Programs

- ☐ Leading to a Bachelor of ____ in ____ degree.
- ☐ Leading to a Bachelor of ____ degree with a major in ____.
- ☐ Leading to a ____ Option within the existing major in ____.
- ☐ Leading to a minor in ____.

Changes to Existing Programs

- ☐ New Admission Requirements for the Major in ____ within the Bachelor of ____.
- ☐ Revised Admission Requirements for the Major in ____ within the Bachelor of ____.
- ☒ Revised Program Requirements for the Major in Paper Science and Engineering within the Bachelor of Science.
Biorescience
- ☐ Revised Requirements for the Option in ____ within the major in ____.
- ☐ Revised Requirements for the Minor in ____.

Other Changes

- ☒ Change name of program from Paper Science and Engineering to Biorescience Science and Engineering.
- ☐ New or Revised Continuation Policy for ____.
- ☐ Eliminate program in ____.

Proposed Effective Date: **Quarter:** ☒ Autumn ☐ Winter ☐ Spring ☐ Summer **Year: 20 10**

Contact Person: Michelle Trudeau

Phone: 6-1533

Email: michtru@uw.edu

Box: 352100

EXPLANATION OF AND RATIONALE FOR PROPOSED CHANGE

For new program, please include any relevant supporting documentation such as student learning outcomes, projected enrollments, letters of support and departmental handouts. (Use additional pages if necessary).

See Attached Document

OTHER DEPARTMENTS AFFECTED

List all departments/units/ or co-accredited programs affected by your new program or changes to your existing program and acquire the signature of the chair/director of each department/unit listed. Attach additional page(s) if necessary. *See online instructions.

Department/Unit:
Chemical Engineering

Chair/Program Director:

Date:

3/6/10

Department/Unit:

Chair/Program Director

Date:

Catalog Copy as currently written. Include only sections/paragraphs that would be changed if your request is approved. Please cross out or otherwise highlight any deletions.

See attached

your request is approved. Please cross

PROPOSED CATALOG COPY

Reflecting requested changes (Include exact wording as you wish it to be shown in the printed catalog. Please underline or otherwise highlight any additions. If needed, attach a separate, expanded version of the changes that might appear in department publications).
Please note: all copy will be edited to reflect uniform style in the General Catalog.

See attached

APPROVALS

Chair/Program Director:

Francis M. Hinchley

Date:

5-4-2010

College/School/Campus Curriculum Committee:

Stephen D. Wint

Date:

17 May 2010

Dean/Vice Chancellor:

David L. Hall

Date:

14 May 2010

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

Date:

5/28/2010

ST TRI-CAMPUS APPROVAL (when needed)

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

Date:

UOW/1

REVERSE

BIORESOURCE SCIENCE AND ENGINEERING CURRICULUM

Background

The Paper Science and Engineering (PSE) faculty recognize that conversion of biomass to fuels and chemicals is becoming a major industry. While conversion of biomass to fibers and fiber products will remain a strong international industry, it is anticipated that it will be complimented and then surpassed by conversion processes that make fuels, high value chemicals from biomass. The PSE faculty are modifying their teaching and research programs in anticipation of this evolving biomass based industry. Three years ago we restructured our graduate and research programs to focus on the production of fuels and chemicals from biomass. Our graduate program is growing and we have been able to secure funding to build and equip our laboratories and pilot areas, and for specific research projects. Following introduction of the new graduate program we began restructuring the Paper Science and Engineering undergraduate program into a broader Bioresource Science and Engineering program. The attached spreadsheet shows the proposed course sequencing of the BSE program. Following are some highlights of the proposed curriculum.

Goals of the BSE program:

- Graduates will be well trained process engineers. They will be able to analyze, operate, control, and design complex processes. They will have a good understanding of product requirements and the interrelationships between raw material qualities, processing conditions, and final product performance.
 - Fiber and paper products. Requires knowledge of fiber processing and physical properties of fiber webs
 - Molecular products. Requires knowledge of processes to breakdown biomass and fractionate components to recover valuable molecules.
- Graduates will have strong background in the physical and chemical properties of biomass
- Graduates will have excellent problem solving skills. Skills developed on open-ended problems that are typical in the production for fiber and molecular products from biomass.
- The BSE program will be complementary to Chemical Engineering. BSE students will be encouraged to take advantage of the 5th year ChemE option

Curriculum highlights

- Freshman Year: Modest changes. Moved BSE 201/202 to Winter quarter – make room for freshman seminar (Introduction to Bioresource Science and Engineering) and to make Autumn quarter less demanding.
- Sophomore Year: Math 308 added to be consistent with CoEngr requirements – plan to have joint degree with CoEnv and CoEngr.
- Junior and Senior Year: Expanded natural products chemistry to 5 credits; Bioresource engineering sequence (Biomass conversion, Biomass fractionation, Modeling and control); Bioresource laboratory (Biomass conversion and fractionation laboratory) hope to make joint with Chem Engr.; Expanded papermaking processes course (incorporates material in eliminated classes), 2 quarter process design sequence (outcome assessment demonstrated need for expanded design, provides more opportunity to work with ESRM capstone design)
- Eliminated 2 courses – Paper physics, Raw materials papermaking

OLD CATALOG

The Bachelor of Science degree with a major in ~~paper~~ science and engineering. ~~Paper~~ science and engineering has ABET accreditation which is recognized by the Council on Postsecondary Accreditation and the U.S. Department of Education as the accrediting agency for engineering in the United States.

Bachelor of Science in ~~Forest Resources~~

Suggested First- and Second-Year School Courses:

~~Paper~~ Science and Engineering: CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154), CHEM 162 (or CHEM 164), CHEM 237, CHEM 238; ECON 200; ENGL 131 (or other 5-credit English composition course); HCDE 231; CHEM E 260; MATH 124, MATH 125, MATH 126, MATH 307; PHYS 121, PHYS 122, PHYS 123; Q SCI 381; PSE 201, PSE 202, PSE 248 and PSE 450.

Department Admission Requirements:

~~Paper~~ Science and Engineering: Students may apply for freshman admission or upper-division admission. Applications are available in Student and Academic Services, 116 Anderson, or through the College of Engineering, 356 Loew, or by visiting the School Web site. ~~Departmental deadlines are July 1 for autumn quarter, October 15 for winter quarter, and January 15 for spring quarter.~~ Admission is competitive; completion of requirements does not guarantee admission. Students may also ~~declare into~~ the Chemical Engineering degree program through the College of Engineering advanced admission program (see College of Engineering section for advanced admission entrance and continuation requirements).

~~Paper~~ Science and Engineering

General Education Requirements (~~91~~ credits)

Written Communication (~~8~~ credits): 5 credits English composition (ENGL 131 preferred); HCDE 231 (3 credits). (Additional 5 credits satisfied by ~~PSE~~ courses shown below.)

~~Mathematics and Statistics~~ (~~23~~ credits): ~~MATH 124, MATH 125, MATH 126, MATH 307; Q SCI 381 or IND E 315 or STAT 390.~~

~~Supporting Sciences~~: (~~43~~ credits): ~~CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154), CHEM 162 (or CHEM 164); CHEM 237, CHEM 238; CHEM E 260; PHYS 121, PHYS 122, PHYS 123.~~

Visual, Literary, & Performing Arts (VLPA) (10 credits): Chosen from the University VLPA list.

Individuals & Societies (7 credits): ECON 200; ~~2~~ credits from the University I&S list; (~~3~~ additional credits satisfied by required ~~PSE~~ courses.)

Major Requirements (~~64-65~~ credits)

~~Chemistry and Chemical Engineering~~ (~~18~~ credits): CHEM 455; CHEM E 310, CHEM E 330, CHEM E 340, CHEM E 436.

~~Paper~~ Science Courses (46-47 credits): ~~PSE 201, PSE 202, PSE 248, PSE 402, PSE 404, PSE 406, PSE 450, PSE 476, PSE 477, PSE 478, PSE 479, PSE 480, PSE 481, PSE 482, PSE 487, PSE 497.~~ All required ~~PSE~~ courses must be completed with at least a 2.0 grade.

~~Electives~~

Technical Electives or Business Option (~~12~~ credits minimum).

Free electives to bring minimum total to 180 credits.

NEW CATALOG

The Bachelor of Science degree with a major in bioresource science and engineering. Bioresource science and engineering has ABET accreditation which is recognized by the Council on Postsecondary

Accreditation and the U.S. Department of Education as the accrediting agency for engineering in the United States.

Bachelor of Science

Suggested First- and Second-Year School Courses:

Bioresource Science and Engineering: CHEM 142 (or CHEM 144), CHEM 152 (or CHEM 154), CHEM 162 (or CHEM 164), CHEM 237, CHEM 238; ECON 200; ENGL 131 (or other 5-credit English composition course); HCDE 231; CHEM E 260; MATH 124, MATH 125, MATH 126, MATH 307; PHYS 121, PHYS 122, PHYS 123; Q SCI 381; PSE 201, PSE 202, PSE 248 and PSE 450.

Department Admission Requirements:

Bioresource Science and Engineering: Students may apply for freshman admission or upper-division admission. Applications and application deadlines are available in Student and Academic Services, 116 Anderson, or through the College of Engineering, 356 Loew, or by visiting the School web site. Admission is competitive; completion of requirements does not guarantee admission. Students may also apply to the Chemical Engineering degree program through the College of Engineering advanced admission program (see College of Engineering section for advanced admission entrance and continuation requirements).

Bioresource Science and Engineering

General Education Requirements (101 credits)

Written Communication (12 credits): 5 credits English composition (ENGL 131 preferred); HCDE 231 (3 credits). (Additional 4 credits satisfied by BSE courses shown below.)

Natural World (64 credits): MATH 125, MATH 126, MATH 307; MATH 308; Q SCI 381 or IND E 315 or STAT 390. CHEM 152 (or CHEM 154), CHEM 162 (or CHEM 164); CHEM 237, CHEM 238; PHYS 121, PHYS 122, PHYS 123; 10 credits from the University NW list outside of major.

Visual, Literary, & Performing Arts (VLPA) (10 credits): Chosen from the University VLPA list.

Individuals & Societies (20 credits): ECON 200; 10 credits from the University I&S list outside of major; (5 additional credits satisfied by required BSE courses.)

Major Requirements (74 credits)

Chemical Engineering 17 credits): CHEM E 310, CHEM E 325, CHEM E 330, CHEM E 340.

Bioresource Science Courses (49 credits): BSE 150, BSE 201, BSE 202, BSE 248, BSE 406, BSE 420, BSE 430, BSE 426, BSE 436, BSE 422, BSE 421, BSE 480, BSE 481, BSE 497. All required BSE courses must be completed with at least a 2.0 grade.

Technical Electives or (6 credits minimum). Six credits of technical electives must be taken from a list of approved engineering electives.

Business Option (12 credits minimum). ESRM 320 (5), ESRM 321 (5), and one course from approved list.

Free electives to bring minimum total to 180 credits.

BIORESOURCE SCIENCE AND ENGINEERING (PROPOSED)

BACHELOR OF SCIENCE

SUGGESTED COURSE SEQUENCING

	AUTUMN	WINTER	SPRING
Freshman Year	CHEM 142 General Chemistry I ^(5 cr) MATH 124 Calculus I ^(5 cr) BSE Freshman Interest Group ^(2 cr) BSE 150 Intro to Bioresources ^(1 cr)	CHEM 152 General Chemistry II ^(5 cr) MATH 125 Calculus II ^(5 cr) BSE 201 Pulp, Paper and Bioproducts ^(3 cr) BSE 202 Pulp & Paper Field ^(1 cr)	CHEM 162 General Chem. III ^(5 cr) MATH 126 Calculus III ^(5 cr) ENGL 131 Composition ^(5 cr)
Sophomore Year	AUTUMN CHEM 237 Organic Chemistry I ^(4 cr) PHYS 121 Mechanics ^(5 cr) Math 307 Differential Equations ^(3 cr) BSE 248* Paper Structure/Prop ^(4 cr)	WINTER CHEM 238 Organic Chemistry II ^(4 cr) PHYS 122 Electromag-Oscill ^(5 cr) MATH 308 Linear Algebra ^(3 cr) HCDE 231 Tech Writing ^(3 cr)	SPRING Q SCI 381 Statistics ^{2 (5 cr)} CHEM E 325 Thermodyn. ^(4 cr) PHYS 123 Waves ^(5 cr) (spring 2011 swap CHEM E 325 and 310)
Junior Year	AUTUMN BSE 406* Natural Products Chem ^(5 cr) CHEM E 310 Material/Energy Balance ^(4 cr) CHEM 455* or Engineering Topics ^(4 cr) (autumn 2011 swap CHEM E 325 and 310)	WINTER (BSE 420* Bioresource Sci/Eng 1 ^(4 cr)) CHEM E 330 Transport Processes ^(5 cr) CHEM E 326* or Engineering Topics ^(4 cr) ECON 200 Microeconomics ^(5 cr)	SPRING BSE 426* Bioresource Lab ^(4 cr) CHEM E 340 Transport II ^(4 cr) (BSE 421* Biores. Sci/Eng 2 ^(4 cr)) CHEM E 436* or Engineering Topics ^(4 cr)
Senior Year	AUTUMN BSE 422* Biores. Sci/Eng 3 ^(4 cr) BSE 430* Paper. Process+ ^(5 cr) BSE 497* Internship ^(1 cr) Any I&S credit ^(5 cr)	WINTER BSE 436* Papermaking Lab II ^(4 cr) BSE 480* Bioresource Design ^(4 cr) Any I&S credit ^(5 cr) Any VLPA ^(5 cr)	SPRING BSE 481* Biores. Design II ^(5 cr) Any VLPA ^(5 cr) General Elective or NW ^(3 cr)

~ 180 credits minimum required for degree ~

ENGINEERING TOPICS & BUSINESS OPTION ELECTIVES (12 credits minimum):

Engineering Topics (min 8 crs): BSE 488; CSE 142*; CHEM E 220*, 326*, 341, 342, 345, 436*, 455, 462, 480, 481; MSE 170, 310, 362, 463, 471, 475; CEE 220, 350, 461, 480, 482, 485, 486, 487, 488, 490, 493, 494; A A 210; E E 215; ESRM 325; IND E 337; M E 230

* Recommended for CHEM E double degree applicants

Business Option (declare through SFR Student Services):

ESRM 320 (5) (required), ESRM 321 (5) (required); Choose one: I BUS 300 (5), MKTG 301 (4), MKTG 335 (4), MKTG 450 (4), ESRM 400 (3), MGMT 300 (4), MGMT 401 (4), MGMT 403 (4), ACCTG 215 (5), ACCTG 225 (5), CFR 519 (5), OPMGT 301 (4).

Contact Chemical Engineering advising if you plan to apply for admission for a double degree:

advising@cheme.washington.edu

Recommended courses to meet
Engineering Topics and General
Electives:

CHEM 455—autumn
CHEM E 326—winter
CHEM E 426—spring

ADDITIONAL COLLEGE OF THE ENVIRONMENT PROFICIENCY & AOK REQUIREMENTS :

1. 10 cr I&S outside of PSE and major
 2. 10 cr NW outside of PSE and major
- General Electives may be used to fulfill these requirements. Remaining Proficiency and Aok requirements are met within the major.

Academic Progress Policy

All PSE students are expected to maintain satisfactory progress with the department and the University.

http://www.cfr.washington.edu/Acad/undergrad/PSE/pse_reqs.htm

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17 May 2010

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Dean L. Hart

Date:

14 May 2010

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

John Schaubert

Date:

5/28/2010

POST TRI-CAMPUS APPROVAL (when needed)

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:

Date: