



OFFICE OF THE PRESIDENT

June 17, 2010

Dean Matthew O'Donnell
College of Engineering
Box 352180

Dean Paul G. Ramsey
School of Medicine
Box 356350

Dear Matt and Paul:

Based on the recommendation of its Subcommittee on Admissions and Programs, the Faculty Council on Academic Standards has recommended approval of the revised admission, program, and continuation policy requirements for a Bachelor of Science in Bioengineering degree. A copy of the changes is attached.

I am writing to inform you that the Department of Bioengineering 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. Laura Wright (with enclosure)
Mr. Robert Corbett (with enclosure)
Dr. Deborah H. Wiegand (with enclosure)
Mr. Todd Mildon, J.D. (with enclosure BIOEN-20100216)



UNIVERSITY OF WASHINGTON

CREATING AND CHANGING UNDERGRADUATE ACADEMIC PROGRAMS

MAY 25 2010
OFFICE USE ONLY
BIOEN-2010-0216

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 Engineering/Medicine

Department/Unit Bioengineering

Date 2/16/10

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 Bioengineering within the Bachelor of Science.
- ☐ Revised Requirements for the Option in _____ within the major in _____.
- ☐ Revised Requirements for the Minor in _____.

Other Changes

- ☐ Change name of program from _____ to _____.
- ☒ New or Revised Continuation Policy for BS Bioengineering.
- ☐ Eliminate program in _____.

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

Contact Person: Laura Wright

Phone: 3-8958

Email: lew3@u.washington.edu

Box: 355061

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).

Our existing undergraduate curriculum has been successful and served many students well, particularly those bound for graduate school. However, the Department of Bioengineering is proposing a thorough revision of its undergraduate curriculum to achieve the following goals:

- 1) Better align the BS BIOE degree program with the research and educational expertise of the Bioengineering faculty;
- 2) Eliminate gaps and redundancies within our subject coverage;
- 3) Allow students to focus their study around their particular interests in bioengineering, via senior elective focuses, more general engineering electives, and expanded choice of capstone projects;
- 4) Better serve our industry-bound students and offer more flexibility to our substantial population of pre-medical students.

We recognize that while this new curriculum may initially affect some transfers and require that they take some additional courses upon transferring in BIOEN, the change to the APPLIED MATH option allows the department to implement much needed revitalization of its undergraduate curriculum. Although MATLAB licenses are expensive, we do recommend to the junior and community colleges that they explore creating courses that provide exposure to MATLAB language using available FREE software alternatives (e.g., Scilab, Octave, FreeMat, JMathLib, Mathnium, and FlexPDE).

Please note that our new capstone option (B) and our new courses BIOEN 401-2-3-4-5 have already

been approved; see CEP meeting minutes for November, 2009. At the same time, IND E 315 was approved as an alternative for STAT 390, and CHEM E 325 was approved as an alternative for AA 260. These newly approved changes are referenced in this application.

The current sequence is as follows.

BIOEN 201: Bioengineering Tools

BIOEN 301: Bioengineering Systems Analysis

BIOEN 302: Introduction to Biomedical Instrumentation

BIOEN 303: Bioengineering Signal Processing

BIOEN 304: Introduction to the Bioengineering Analysis of Physiology I

BIOEN 305: Introduction to the Bioengineering Analysis of Physiology II

BIOEN 357: Introduction to Molecular Bioengineering

The existing courses will be replaced by an entirely new sequence of courses, as follows.

BIOEN 215: Introduction to Bioengineering Problem Solving

BIOEN 315: Biochemical and Molecular Bioengineering

BIOEN 316: Bioengineering Signals and Sensors

BIOEN 317: Biochemical Signals and Sensors Laboratory

BIOEN 325: Momentum and Heat Transport in Biological Systems

BIOEN 326: Solid and Gel Mechanics

BIOEN 327: Fluids and Materials Laboratory

BIOEN 335: Mass Transport and Rate Processes

BIOEN 336: Bioengineering Systems and Control

BIOEN 337: Transport and Systems Laboratory

BIOEN 345: Failure Analysis of Human Physiology

Change to continuation policy: We are not changing the actual policy but simply changing the course numbers to reflect our new curriculum.

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: PLEASE SEE ATTACHED "OTHER DEPARTMENTS AFFECTED" list	Chair/Program Director:	Date:
Department/Unit:	Chair/Program Director	Date:

CATALOG COPY

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.

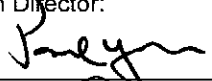
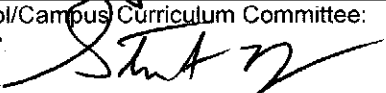
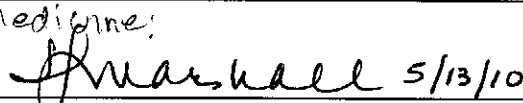

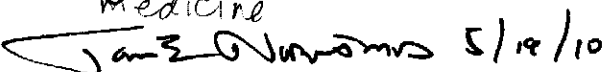
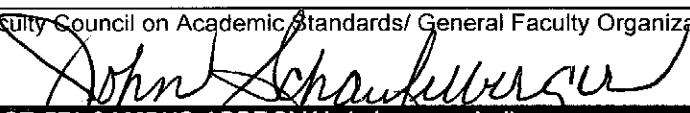

Please see attached "Current Catalog Copy"

PROPOSED CATALOG COPY

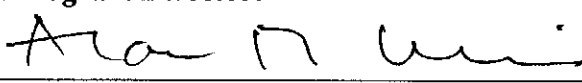

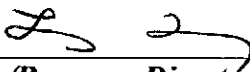
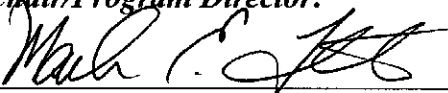
Reflecting requested changes (Include exact wording as you wish it to be shown in the printed catalog. Please underline or otherwise highlight any additions. If needed, attach a separate, expanded version of the changes that might appear in department publications).
Please note: all copy will be edited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

Please see attached "Proposed Catalog Copy"

APPROVALS

Chair/Program Director:		Date:	1/23/10
College/School/Campus Curriculum Committee:	<div>Engineering: </div> <div>Medicine:  5/13/10</div>	Date:	3/3/10
Dean/Vice Chancellor:	<div>Engineering: </div> <div>Medicine:  5/14/10</div>	Date:	3-4-10
Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:		Date:	6/11/2010
POST TRI-CAMPUS APPROVAL (when needed)			
Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:		Date:	

OTHER DEPARTMENTS AFFECTED

Department/Unit: Biochemistry	Chair/Program Director: 	Date: 2/5/10
Department/Unit: Chemical Engineering	Chair/Program Director: 	Date: 2/1/10
Department/Unit: Electrical Engineering	Chair/Program Director: 	Date: 1/25/20.
Department/Unit: Mechanical Engineering	Chair/Program Director: 	Date: 2/3/10

CURRENT COPY

Department Admission Requirements

Admission is competitive. Students may be admitted at three different points. Consult the department's Web site for more information.

1. *Direct Admission.* The department enrolls up to 25 percent of its incoming class directly from high school. Students accepted to the UW who indicate bioengineering as their preferred major on their freshman application are considered. Strong applicants have completed chemistry, biology, and calculus in high school. Admission is for autumn quarter only.
2. *Early Admission.* Students enrolled at the UW are eligible to apply at the end of the freshman year if they have completed and earned at least a 2.50 GPA in the following courses: MATH 124, MATH 125, MATH 126, CHEM 142, CHEM 152, CHEM 162, and 5 credits of English composition. A 2.50 GPA guarantees consideration but not admission. Application deadline is July 1 for autumn quarter admission.
3. *Upper Admission.* Requires 59 credits of coursework with at least a 2.50 GPA: MATH 124, MATH 125, MATH 126; CHEM 142, CHEM 152, CHEM 162; PHYS 121, PHYS 122; BIOL 180, BIOL 200; CSE 142; and 5 credits of English composition. A 2.50 GPA guarantees consideration but not admission. Application deadlines are February 1 for spring quarter and July 1 for autumn quarter. Consult the department's Web site or adviser for more details.

Graduation Requirements

Students follow requirements in effect at time of entry into the department. 180 credits as follows:

General Education Requirements (105 credits):

1. *Areas of Knowledge:* 24 total credits in Visual, Literary, & Performing Arts (VLPA) and Individuals & Societies (I&S), with at least 10 credits in each area.
2. *Written and Oral Communication (8 credits):* 5 credits of English composition, from the approved University list; HCDE 231. Additional writing credits are built into the major core courses.
3. *Mathematics (25 credits):* MATH 124, MATH 125, MATH 126, ~~MATH 307, MATH 308~~; STAT 390.
4. *Natural Science (47 credits):* CHEM 142, CHEM 152, CHEM 162, and CHEM 223 or CHEM 237; PHYS 121, PHYS 122, ~~PHYS 123~~; ~~BIOL 180, BIOL 200~~; ~~BIOC 405~~.
5. *General Elective (1 credit)*

Major Requirements (75 credits):

1. *Engineering Fundamentals (17 credits):* ~~CHEM E 260; CSE 142, CSE 143; E E 215.~~
2. *Bioengineering Core (38 credits):* ~~BIOEN 201, BIOEN 301, BIOEN 302, BIOEN 303, BIOEN 304, BIOEN 305, BIOEN 357, BIOEN 401; either 10 credits of BIOEN 402 or 4 credits of BIOEN 403 plus BIOEN 404 and 405.~~
3. *Bioengineering Senior Electives (15 credits):* ~~Fifteen credits chosen from BIOEN 420, BIOEN 440, BIOEN 455, BIOEN 457, BIOEN 467, BIOEN 485, BIOEN 490, BIOEN 491, BIOEN 492. One of these courses must be "design-designated" (see department for current list).~~
4. *Approved Engineering Electives (3 credits):* ~~Three credits of approved engineering electives, chosen from a departmentally approved list or from additional bioengineering senior elective credit. See departmental Web site for approved list.~~
5. *Free Electives (2 credits).*

Current Continuation Policy:

1. The BS BIOE is meant to be taken on a full-time basis. Full-time students are expected to complete 12 or more credits applicable to the degree each academic quarter.
2. In exceptional circumstances, students may petition the Department for permission to take fewer than 12 credits. A request for part-time status should be made to the academic counselor prior to the first day of the quarter. Students who receive permission to attend part-time must complete at least one course applicable towards their degree each quarter.
- ~~3. Each entering class of bioengineering majors begins the core courses with BIOEN 301 (301 follows a preparatory course, 201). Students are required to move through their remaining core courses with their cohort (the group they entered with).~~
4. The Department recognizes that exceptional circumstances (death in the family, major illness) may delay degree progress. In addition, educational opportunities such as study abroad or engineering co-op may warrant the extension of a student's program. Students should bring such situations to the academic counselor at the first opportunity. Exceptions to criteria 1-3 require advance permission by way of petition.
- ~~5. Once a student begins BIOEN 482, Bioengineering Capstone Project, remaining BIOEN 482 credits must be completed in successive quarters. Exceptions must be approved by the faculty supervisor and documented in the student file.~~
6. A student who withdraws from the University or from a required bioengineering course or whose quarter schedule is cancelled for non-payment of fees must obtain permission from the Department before registering for subsequent bioengineering courses. Petitions should be made through the academic counselor.
7. Bioengineering majors must earn a 2.0 or better in each Bioengineering course used for degree requirements. A course may be taken twice to satisfy this requirement. The Bioengineering major GPA must be a 2.0 or better at graduation.

PROPOSED COPY

Department Admission Requirements

Admission is competitive. Students may be admitted at three different points. Consult the department's Web site for more information.

1. *Direct Admission.* The department enrolls up to 25 percent of its incoming class directly from high school. Students accepted to the UW who indicate bioengineering as their preferred major on their freshman application are considered. Strong applicants have completed chemistry, biology, and calculus in high school. Admission is for autumn quarter only.
2. *Early Admission.* Students enrolled at the UW are eligible to apply at the end of the freshman year if they have completed and earned at least a 2.50 GPA in the following courses: MATH 124, MATH 125, MATH 126, CHEM 142, CHEM 152, CHEM 162, and 5 credits of English composition. A 2.50 GPA guarantees consideration but not admission. Application deadline is July 1 for autumn quarter admission.
3. *Upper Admission.* Requires 59 credits of coursework with at least a 2.50 GPA: MATH 124, MATH 125, MATH 126; CHEM 142, CHEM 152, CHEM 162; PHYS 121, PHYS 122; BIOL 180, BIOL 200; AMATH 301; and 5 credits of English composition. Any of BIOL 180, PHYS 122, and AMATH 301 may be in progress at time of application. A 2.5 GPA guarantees consideration but not admission. Application deadlines are February 1 for spring quarter and July 1 for autumn quarter. Consult the department's web site or adviser for more details.

Graduation Requirements

General Education Requirements (108 credits):

1. *Areas of Knowledge:* 24 total credits in Visual, Literary, & Performing Arts (VLPA) and Individuals & Societies (I&S), with at least 10 credits in each area.
2. *Written and Oral Communication (8 credits):* 5 credits of English composition, from the approved University list; HCDE 231. Additional writing credits are built into the major core courses.
3. *Mathematics (24 credits):* MATH 124, MATH 125, MATH 126, either MATH 307 or AMATH 351, either MATH 308 or AMATH 352; STAT 390 or IND E 315.
4. *Natural Science (44 credits):* CHEM 142, CHEM 152, CHEM 162, and CHEM 223 or CHEM 237; PHYS 121, PHYS 122; BIOL 180, BIOL 200, BIOL 220.
5. *General Elective (8 credits)*

Major Requirements (72 Credits)

1. *Engineering Fundamentals (4 credits):* AMATH 301.
2. *Bioengineering Core (44 Credits):* BIOEN 215, BIOEN 315, BIOEN 316, BIOEN 317, BIOEN 325, BIOEN 326, BIOEN 327, BIOEN 335, BIOEN 336, BIOEN 337, BIOEN 345, BIOEN 401; either: 1) 10 credits of BIOEN 402; or 2) 4 credits of BIOEN 403 plus BIOEN 404 and 405.
3. *Bioengineering Senior Electives (15 credits):* 15 credits from an approved departmental list, including the completion of one of three concentration areas:
Molecular and Materials Bioengineering; Cells, Tissue, and Systems Bioengineering; Diagnostic and

Therapeutic Instruments.

Molecular and Materials Bioengineering: 4 courses from approved departmental concentration list.

Cells, Tissue, and Systems Bioengineering: 4 courses from approved departmental concentration list.

Diagnostics and Therapeutic Instruments: PHYS 123; 4 courses from approved departmental concentration list.

See department for approved list.

4. *Approved Engineering Electives (9 credits):* Nine credits of approved engineering electives, chosen from a departmentally approved list or from additional bioengineering senior elective credit. See department for approved lists.

5. *minimum grade of 2.0 in each Bioen course used for the degree*

Revised Continuation Policy:

1. The BS BIOE is meant to be taken on a full-time basis. Full-time students are expected to complete 12 or more credits applicable to the degree each academic quarter.
2. In exceptional circumstances, students may petition the Department for permission to take fewer than 12 credits. A request for part-time status should be made to the academic counselor prior to the first day of the quarter. Students who receive permission to attend part-time must complete at least one course applicable towards their degree each quarter.
3. Each entering class of bioengineering majors begins the junior core courses with BIOEN 315, 316, and 317 (there is a prior introductory course, BIOEN 215). Students are required to move through the remaining core courses with their cohort. Rare exceptions may be granted by petition to the Student Affairs Committee.
4. The Department recognizes that exceptional circumstances (death in the family, major illness) may delay degree progress. In addition, educational opportunities such as study abroad or engineering co-op may warrant the extension of a student's program. Students should bring such situations to the academic counselor at the first opportunity. Exceptions to criteria 1-3 require advance permission by way of petition.
5. Once a student begins BIOEN 402 or 403, the remaining credits in 402 or 403 must be taken in successive quarters. Exceptions must be approved by the faculty supervisor and documented in the student file.
6. A student who withdraws from the University or from a required bioengineering course or whose quarter schedule is cancelled for non-payment of fees must obtain permission from the Department before registering for subsequent bioengineering courses. Petitions should be made through the academic counselor.
7. Bioengineering majors must earn a 2.0 or better in each Bioengineering course used for degree requirements. A course may be taken twice to satisfy this requirement. The Bioengineering major GPA must be a 2.0 or better at graduation.

Jennifer A. Payne

From: Kelli Jayn Nichols [knichols@u.washington.edu]

Sent: Thursday, June 03, 2010 10:36 AM

To: 'uwcr'

Cc: 'Laura E. Wright'

Subject: RE: Proposed BIOEN reqs

Hi, Jennifer,

DARS should be checking for concentration requirements. Below are the current departmental lists for each concentration. We will be adding/subtracting courses as new courses come on line over the next two years. A couple of courses are in process already. I know that they look ***very*** similar right now, but this will change somewhat over the next two-three years. The requirement structure will be correct if DARS is checking to see that reqs have been met for at least one concentration. (The concentrations aren't listed on the diploma, with the exception of the new NME option, still in progress).

Just to clarify, there will be slightly different lists of approved senior electives for each concentration. However, there will be one big list of BIOE Senior Electives for the remaining sr elective credit, and one big list of Approved Engineering Electives for those credits.

1) Molecular and Materials Bioengineering Concentration:

4 courses from approved departmental concentration list (Currently 440, 455, 457, 467, 490, 491, 492); additional Bioengineering Senior Elective credit to total 15 (see departmental list); Additional Approved Engineering Elective credit to total 9 (see departmental list).

2) Cells, Tissue, and Systems Bioengineering Concentration:

4 courses from approved departmental concentration list (currently 423, 424, 425, 440, 457, 467, 485, 490, 491); additional Bioengineering Senior Elective credit to total 15 (see departmental list); additional Approved Engineering Elective credit to total 9 (see departmental list).

3) Diagnostics and Therapeutic Instruments Concentration:

PHYS 123; Four courses from approved departmental concentration list (Currently BIOEN 420, 423, 424, 425, 455, 440, 490, 491, 492); additional Bioengineering Senior Elective credit to total 15 (see departmental list); additional Approved Engineering Elective credit to total 9 (see departmental list).

Please let us know if there are other questions!

Regards,

Kelli Jayn Nichols

From: Laura E. Wright [mailto:lew3@u.washington.edu]

Sent: Thursday, June 03, 2010 9:20 AM

To: KELLI J. NICHOLS

Subject: FW: Proposed BIOEN reqs

See below – what do you think?

I have the following courses per concentration:

Molecular and Materials:

Concentration list: 4 courses from 440, 455, 457, 467, 490, 491, or 492 (no 488 – Daggett's course – yet); additional senior elective credit to equal 15 credits total of bioengineering electives (see

6/3/2010

departmental list); additional approved elective credit to equal 9 credits

Cells, Tissue and Systems: 4 courses from 421, 423, 424, 425, 467, 485; additional senior elective credit to equal 15 credits total of bioengineering electives (see departmental list); additional approved engineering elective credit to equal 9 credits

Diagnostics and Therapeutic Instruments: PHYS 123; 4 courses from BIOEN 420, 423, 424, 425, 455, 491; additional senior elective credit to equal 15 credits total of bioengineering electives (see departmental list); additional approved engineering elective credit to equal 9 credits

Laura Wright
UW Bioengineering
lew3@u.washington.edu / (206)543-8958

From: UWCR [mailto:uwcr@uw.edu]
Sent: Thursday, June 03, 2010 8:05 AM
To: Laura E. Wright
Subject: RE: Proposed BIOEN reqs

Are there specific courses within each concentration students need to take and thus DARS would need to track or do you just want to keep DARS checking for a specific number of engineering electives?

Jennifer

From: Laura E. Wright [mailto:lew3@u.washington.edu]
Sent: Wednesday, June 02, 2010 3:59 PM
To: 'uwcr'
Subject: FW: Proposed BIOEN reqs

Keep the 2.0 or better. Do you just need the names of the concentration areas?

They are as follows:

Molecular and Materials Bioengineering Concentration
Cells, Tissue, and Systems Bioengineering Concentration
Diagnostics and Therapeutic Instruments

Laura Wright
UW Bioengineering
lew3@u.washington.edu / (206)543-8958

From: Jennifer A. Payne
Sent: Wednesday, June 02, 2010 3:49 PM
To: Laura E. Wright
Subject: FW: Proposed BIOEN reqs

Laura,

Can you please confirm that you want to keep the 2.0 or better in each BIOEN course.

Also what are the "concentrations" so that DARS can code them?

6/3/2010

Jennifer

1

From: Tom Anderson [mailto:tanders@u.washington.edu]
Sent: Wednesday, June 02, 2010 3:44 PM
To: Jennifer A. Payne
Subject: Proposed BIOEN reqs

- 1) Currently, the list of "Bioengineering Seniors Electives" appears in the catalog. The new requirement is for 15 credits within one concentration. I can't find the course lists for those in the 1503.
- 2) DARS has an "approved engr electives" list. I'll use that one, and any requests for changes will get referred to you.
- 3) The minimum grade and GPA info is currently within the major requirements in the catalog. In the 1503, it's dropped down to the bottom of the continuation policy. We have to make sure it doesn't disappear from the major reqs in the catalog.
7. Bioengineering majors must earn a 2.0 or better in each Bioengineering course used for degree requirements. A course may be taken twice to satisfy this requirement. The Bioengineering major GPA must be a 2.0 or better at graduation.

Thanks.

-Tom

-----Original Message-----

From: Jennifer A. Payne [mailto:jap2@u.washington.edu]
 Sent: Wednesday, June 02, 2010 1:47 PM
 To: 'Alex Bolt'; 'ASUW'; Bradley R. Holt; 'Capt. Nick Holman'; David M. Sayrs; Deborah H. Wiegand; 'dnjan@msn.com'; 'Emily Leggio'; 'Jennifer Taggart'; John E. Schaufelberger; Maggie Fultz-Valenta; Matthew S. Winslow; Michelle M. Trudeau; 'mtown@u.washington.edu'; 'Nancy Bradshaw'; 'Patrica Kramer'; Philip A. Ballinger; Robert Corbett; Tina Miller; Todd B. Mildon; Thomas Anderson; 'uwcr@u.washington.edu'; Vikki H. Day
 Subject: SCAP Agenda for 6/4/2010

Hello SCAPer's,

Attached is the agenda for this Friday's meeting. There might be a few more revisions to the OCEAN catalog copy, but I should have it completed by Friday afternoon.

Thanks.

Jennifer

6/3/2010

Bachelor of Science in Bioengineering

<http://depts.washington.edu/bioe/> bioeng@u.washington.edu

Updated 2/1/2010

Bioengineers solve biological and medical problems by using physical and engineering principles. Bioengineers began by applying mechanical, chemical, and electrical engineering principles to create devices or tools to improve human health and health care. Today bioengineers also combine biological and non-biological materials to create tools at the molecular level for diagnosing and treating disease. At UW BIOE, our research ranges from asking basic science questions to engineering clinical solutions. We don't just add a few biology classes to a standard engineering major. Instead, we educate engineers who understand how biological and non-biological systems combine to create new properties and who know how to re-engineer biological components and complete systems. Our graduates can work fluently with scientists, physicians, and other engineers and are well prepared for graduate school, medical school, and industry.

Our Research: see website for details

Bioinstrumentation

- Microfluidic devices & systems
- Chemical detection systems for low-cost instrumentation
- Surface analytical tools & methods
- Hardware & software for imaging
- Research tool development

Biomaterials & Tissue Engineering

- Tissue engineering & regenerative therapy
- Growing replacement tissue & whole organs
- Medical biomaterials & bio-interface
- Microbial adhesion & biofilms

Global Health, Distributed Diagnosis & Home Healthcare (D2H2)

- Inexpensive point-of-care diagnostic systems
- Therapeutics for global health
- Enhanced healthcare data acquisition & delivery systems

Imaging & Image-Guided Therapy

- Molecular imaging
- Novel imaging modalities at the cellular & organismal level
- High-intensity focused ultrasound (HIFU)
- Image processing technologies
- Integrating imaging with therapeutic procedures

Integrative Physiology, Systems Biology & Synthetic Biology

- Integrative physiology & the physiome
- Pharmacokinetics & pharmacodynamics
- Systems biology
- Synthetic biology

Molecular Bioengineering

- Controlled-release of therapeutic agents
- Targeted delivery of therapeutic agents & nucleic acids
- Better protein-binding molecules for diagnostics & therapeutics
- Nanoparticulate systems
- Molecular mechanics & protein folding

Neural Engineering, Rehabilitation & Augmentation

- New devices for neural study & manipulation
- New computational architectures based on neural algorithms
- Better haptic & human-computer-machine interfaces Systems for rehabilitation & augmentation
- Better prosthetics & robots

Understanding Nature through Engineering

- Biomechanics
- Muscle physiology
- Mechanisms of biological motion
- Water structure & hydrogels
- Oceanic carbon & hydrogels

Admission into the Bioengineering Program

Students can apply to the Department of Bioengineering using the College of Engineering web-based application, available at www.engr.washington.edu/uapp/. Admission is competitive and will be based on prerequisite course work, a minimum overall GPA of 2.50, a personal statement describing interest in bioengineering, and any work/research experience (especially if related to the field). Satisfying minimum requirements guarantees consideration but not acceptance. Students who do not meet the minimum requirements may petition for special consideration. Please contact the Bioengineering Academic Counselor.

UPPER ADMISSION Applies to February 1, 2011 applicants and beyond.

The deadline for Upper Admission is **February 1** for Spring Quarter. (The Upper Admission deadline of July 1 for Autumn Quarter is limited to selected students only.) Upper Admission is appropriate for students who wish to apply during their sophomore year. To be eligible, applicants are required to complete 59 prerequisite credits (please see notes* **). Students may apply with credits in progress, but CHEM 162, MATH 126, and English Composition are expected to be complete.

CHEM 142, 152, 162 (or honors equivalent)	15
MATH 124, 125, 126 (or honors equivalent)	15
English Composition course	5
AMATH 301 *	4
PHYS 121, 122	10
BIOL 180, 200 (please see note**)	10
TOTAL	59
BIOEN 215 (please see note***)	3

* New requirement, subject to college approval.

** Upper Admission applicants who are unable to register for BIOL 180 by Autumn Quarter of their sophomore year due to space limitations should email the Bioengineering Academic Counselor for more information. bioeng@u.washington.edu

*** BIOEN 215 may be winter of the freshman or sophomore year. For Spring Upper Admission applicants, BIOEN 215 may be in progress at the time of application. Course will be taught for the first time WIN 2011.

EARLY ADMISSION Applies to July 1, 2010 applicants and beyond.

The deadline for Early Admission is **July 1** for Autumn Quarter. Early Admission is appropriate for students at the end of their freshman year. Students completing their first year with advanced standing because of Running Start, AP, or IB credits are also considered part of this group. To be eligible for Early Admission, applicants are required to have completed 35 prerequisite credits 15 of which need to have been taken at the UW. Students who have fulfilled the listed requirements with Running Start, AP, or IB credits should consult the Bioengineering Academic Counselor.

CHEM 142, 152, 162 (or honors equivalent)	15
MATH 124, 125, 126 (or honors equivalent)	15
English Composition course	5
TOTAL	35

DIRECT ADMISSION: Suspended for autumn 2010; returns autumn 2011.

The department encourages any incoming freshman with a strong interest in bioengineering to apply for Direct Admission. When applying to the University of Washington, students are able to indicate their interest in Bioengineering on their general admission application. Priority consideration is given to those who apply to the University of Washington by **December 1**. (Students applying for Direct Admission do not need to fill out the College of Engineering web-based application).

Direct Admission into the Bioengineering undergraduate program is highly selective and we are only able to admit a small number of students each year. Admission is based on courses taken in high school, GPA, college entrance exam scores, motivation, commitment to the field, and other factors. Students are eligible for review by the department only after being accepted to the University. Please contact the Bioengineering Academic Counselor for more information.

Proposed Curriculum for Bachelor of Science in Bioengineering

*Subject to approval by college

TOTAL CREDITS FOR DEGREE = 180

Mathematics (25 credits)

Course	Topic	Credits
MATH 124, 125, 126	Calculus with Analytic Geometry I, II, III	15
MATH 307 or AMATH 351	Introduction to Differential Equations OR Differential Equations	3
MATH 308 or AMATH 352	Matrix Algebra with Applications OR Applied Linear Algebra and Numerical Analysis	3
STAT 390 or IND E 315	Probability and Statistics in Engineering and Science OR Probability and Statistics for Engineers	3
TOTAL		24

Natural Science (47 credits)

Course	Topic	Credits
CHEM 142, 152, 162	General Chemistry	15
CHEM 223 or 237	Organic Chemistry	4
PHYS 121	Mechanics, with Lab	5
PHYS 122	Electromagnetism and Oscillatory Motion, with Lab	5
BIOL 180, 200, 220	Introductory Biology	15
TOTAL		44

Written and Oral Communications (8 credits)

Course	Topic	Credits
ENGL COMP	Approved University Composition Course	5
HCDE 231	Introduction to Technical Writing	3
TOTAL		8

VLPA and I&S (24 credits)

Twenty-four total credits in **Visual, Literary, and Performing Arts (VLPA)** and **Individuals and Societies (I&S)** with no fewer than 10 credits in each category.

General Elective (8 credits)

8 credits from the University's course offerings; student's choice.

8

Engineering Fundamentals (4 credits)

Course	Topic	Credits
AMATH 301	Beginning Scientific Computing	4
TOTAL		4

Bioengineering Core (31 credits)

Course	Topic	Credits
BIOEN 215	BIOE Problem Solving	3
BIOEN 315	Biochemical and Molecular Bioengineering	3
BIOEN 316	Biomedical Signals and Sensors	3
BIOEN 317	Biomedical Signals and Sensors Lab	2
BIOEN 325	Biotransport I	3
BIOEN 326	Solid and Gel Mechanics	3
BIOEN 327	Fluids and Biomaterials Lab	2
BIOEN 335	Biotransport II	3
BIOEN 336	Bioengineering Systems and Control	3
BIOEN 337	Mass Transport and Systems Lab	2
BIOEN 345	Failure Analysis of Human Physiology with Lab	4
TOTAL		31

Senior Emphasis

Complete one of the following three concentrations:

1) Molecular and Materials Bioengineering concentration:

4 courses from approved departmental emphasis list; additional Bioengineering Senior Elective credit to total 15 (see departmental list); additional approved engineering elective credit to total 9 (see departmental list).

(Current emphasis list: BIOEN 440, 455, 457, 467, 490, 491, 492; new courses under development)

2) Cells, Tissue, and Systems Bioengineering concentration:

4 courses from approved departmental emphasis list; additional Bioengineering Senior Elective credit to total 15 (see departmental list); additional approved engineering elective credit to total 9 (see departmental list).

(Current emphasis list: BIOEN 423, 424, 425, 440, 467, 485, 490, 491; new courses under development)

3) Diagnostics and Therapeutic Instruments emphasis:

PHYS 123; 4 courses from approved departmental emphasis list; additional Bioengineering Senior Elective credit to total 15 (see departmental list); additional approved engineering elective credit to total 9 (see departmental list).

(Current emphasis list: BIOEN 420, 423, 424, 425, 455, 440, 490, 491, 492; new courses under development)

Bioengineering Senior Capstone: Capstone Project will relate to chosen senior emphasis. You may choose to pursue **option A**, integrated design and research, or **option b**, research project and small group design and build project.

Course	Topic	Credits
BIOEN 401	BioE Capstone Fundamentals	3
BIOEN 402 (option A) or 403-404-405 (option B)	BioE Capstone Project	10
TOTAL		13

Bioengineering Senior Electives

Course	Topic	Credits
BIOEN 420 (design)	Medical Imaging	4
BIOEN 421	Neural Engineering (new course in process)	3/4
BIOEN 423	Introduction to Systems and Synthetic Biology	3
BIOEN 424 (design)	Advanced Systems and Synthetic Biology	3
BIOEN 425	Laboratory Methods in Systems and Synthetic Biology	4
BIOEN 440 (design)	Introduction to Biomechanics	4
BIOEN 455	BioMEMS	4
BIOEN 457	Advanced Molecular Bioengineering	4
BIOEN 467	Biochemical Engineering	3
BIOEN 485 (design)	Computational Bioengineering	4
BIOEN 487 (design)	Bioengineering and Nanotechnology (new course in process)	3/4
BIOEN 488 (design)	Computational Protein Design (new course in process)	3/4
BIOEN 490 (design)	Engineering Materials for Biomedical Application	3
BIOEN 491 (design)	Controlled-Release Systems	3
BIOEN 492	Surface Analysis	3

Approved Engineering Elective

Additional BIOE senior electives or course from the following list. Additional engineering courses may be approved by advance petition.

AA 419 - Aerospace Heat Transfer (3)	IND E 250 - Fundamentals of Engineering Economy (4)
AA 430 - Finite Element Structural Analysis (3)	IND E 337 - Introduction to Manufacturing Systems (4)
CHEM E 310 - Material and Energy Balances (4)	IND E 351 - Human Factors in Design (4)
CHEM E 326 - Chemical Engineering Thermodynamics (4)	IND E 426 - Reliability Engineering and System Safety (4)
CHEM E 330 - Transport Processes 1 (5)	IND E 470 - Systems Engineering (4)
CHEM E 340 - Transport Processes 2 (4)	MSE 321 - Thermodynamics and Phase Equilibrium (4)
CHEM E 345 - Introduction to Fuel Cells (3)	MSE 322 - Kinetics and Microstructural Evolution (4)
CHEM E 465 - Reactor Design (4)	MSE 331 - Crystallography and Structure (3)
CHEM E 481 - Process Optimization (3)	MSE 333 - Materials Characterization (3)
CHEM E 484 - Electronic and Optoelectronic Polymers (3)	MSE 352 - Functional Properties of Materials 1 (3)
CEE 220 - Introduction to Mechanics of Materials (4)	MSE 362 - Mechanical Behavior of Materials 1 (3)
CEE 342 - Fluid Mechanics (4)	MSE 431 - Failure Analysis and Durability of Materials (3)
CEE 350 - Environmental Engineering (4)	MSE 452 - Functional Properties of Materials 2 (3)
CEE 480 - Air-quality Modeling (3)	MSE 462 - Mechanical Behavior of Materials 2 (4)
CEE 495 - Sustainability and Design for Environment (3)	MSE 471 - Intro to Polymer Science and Engineering (3)
CSE 143 - Computer Engineering II (4)	MSE 481 - Science and Technology of Nanostructures (3)
CSE 321 - Discrete Structures (4)	M E 230 - Kinematics and Dynamics (4)
CSE 326 - Data Structures (4)	M E 295 - Product Dissection (3)
CSE 341 - Programming Languages (4)	M E 333 - Introduction to Fluid Mechanics (5)
CSE 370 - Introduction to Digital Design (4)	M E 354 - Mechanics of Materials Laboratory (5)
CSE 373 - Data Structures and Algorithms (3)	M E 373 - Introduction to system Dynamics (5)
CSE 410 - Computer Systems (3)	M E 392 - Concurrent Engineering (3)
CSE 417 - Algorithms and Computational Complexity (3)	M E 406 - Corrosion and Surface Treatment of Materials (3)
CSE 427 - Computational Biology (3)	M E 415 - Sustainability and Design for Environment (3)
EE 271 - Digital Circuits and Systems (5)	M E 431 - Advanced Fluid Mechanics (4)
EE 361 - Applied Electromagnetics (5)	M E 436 - Friction and Wear of Materials (3)
EE 401 - Engineering Design in Large Teams (4)	M E 440 - Advanced Mechanics of Materials and Solids (3)
EE 462 - Principles of Mobile Robotics (4)	M E 471 - Automatic Control (4)
EE 484 - Sensors and Sensor Systems (4)	M E 473 - Instrumentation (4)
ENGR 360 - Introductory Acoustics (3)	M E 477 - Embedded Computing in Mechanical systems (4)

PROPOSED BIOENGINEERING SAMPLE CURRICULUM

Freshman – Autumn		Freshman – Winter		Freshman – Spring	
MATH 124 – Calculus I	5	MATH 125 – Calculus II	5	MATH 126 – Calculus III	5
CHEM 142 – Gen Chem & Lab I	5	CHEM 152 – Gen Chem & Lab II	5	CHEM 162 – Gen Chem & Lab III	5
ENGL COMP	5	BIOEN 215 - Intro to BioE Problem Solving	3	AMATH 301	4
		VLPA/I&S	3	General Elective (seminar)	1
QUARTER TOTAL	15	QUARTER TOTAL	16	QUARTER TOTAL	15

Sophomore – Autumn		Sophomore – Winter		Sophomore – Spring	
BIOL 180 – Intro to Biology I	5	BIOL 200 – Intro to Biology II	5	BIOL 220 – Intro to Biology III	5
Physics 121 – Mechanics	5	PHYS 122 – Electro & Lab	5	MATH 308/AMATH 352	3
Chem 223 or 237 Organic Chemistry	4	MATH 307/ AMATH 351	3	BIOEN 315 - Biochemical & Molecular Bioengineering	3
		HCDE 231	3	BIOEN 316 - Biomedical Signals and Sensors	3
				BIOEN 317 - Biomedical Signals and Sensors Lab	2
QUARTER TOTAL	14	QUARTER TOTAL	16	QUARTER TOTAL	16

Junior – Autumn		Junior – Winter		Junior – Spring	
BIOEN 325 – Biotransport I	3	BIOEN 335 - BIOE Biotransport II	3	BIOEN 345 - Failure Analysis of Human Physiology, with Lab	4
BIOEN 326 – Solid and Gel Mechanics	3	BIOEN 336 – BioE Systems and Control	3	BIOEN 401 - BIOE Capstone Fundamentals	3
BIOEN 327 - Fluids & Materials Lab	2	BIOEN 337 – Mass Transport and Systems Lab	2	Bioengineering Elective	3
STAT 390/Ind E 315	3	ENGR Elective	3	ENGR Elective	3
VLPA/I&S	5	VLPA/I&S	5	VLPA/I&S	2
QUARTER TOTAL	16	QUARTER TOTAL	16	QUARTER TOTAL	15

Senior – Autumn		Senior – Winter		Senior – Spring	
BIOEN 402 or 403 Capstone	Var*/2	BIOEN 402 or 404 Capstone	Var*/2 + 3	BIOEN 402 or 405 Capstone	Var*/2 + 3
BIOEN Concentration – Elective 1	3	BIOEN Concentration– Elective 2	3	BIOEN Concentration– Elective 3	3
BIOEN Elective	3	ENGR Elective	3	General Elective	2
VLPA/I&S	5	VLPA/I&S	5	General elective	5
QUARTER TOTAL	14	QUARTER TOTAL	14	QUARTER TOTAL	14

*Two capstone concentration: BIOEN 402, for a total of 10 credits; or BIOEN 403 (2+2), BIOEN 404 (3) and BIOEN 405 (3), for a total of 10 credits.

PROPOSED BIOENGINEERING SAMPLE CURRICULUM (PREMED, COMPLETE IN 4 YEARS)

Freshman – Autumn		Freshman – Winter		Freshman – Spring		Freshman - Summer	
MATH 124 – Calculus I	5	MATH 125 – Calculus II	5	MATH 126 – Calculus III	5		
CHEM 142 – Gen Chem & Lab I	5	CHEM 152 – Gen Chem & Lab II	5	CHEM 162 – Gen Chem & Lab III	5		
ENGL COMP	5	BIOEN 215 - Intro to BioE Problem Solving	3	AMATH 301	4		
		VLPA/I&S	3				
QUARTER TOTAL	15	QUARTER TOTAL	16	QUARTER TOTAL	14		

Sophomore – Autumn		Sophomore – Winter		Sophomore – Spring		Sophomore - Summer	
BIOL 180 – Intro to Biology I	5	BIOL 200 – Intro to Biology II	5	BIOL 220 – Intro to Biology III	5	Chem 241	3
Physics 121 – Mechanics	5	PHYS 122 – Electro & Lab	5	Chem 239	3	Math 308/ AMATH 352	3
Chem 223 or 237	4	MATH 307/ AMATH 351	3	BIOEN 315 - Biochemical & Molecular Bioengineering	3	HCDE 231	3
		Chem 238	4	BIOEN 316 – Biomedical Signals and Sensors	3		
				BIOEN 317 - Biomedical Signals and Sensors Lab	2		
QUARTER TOTAL	14	QUARTER TOTAL	17	QUARTER TOTAL	16	QUARTER TOTAL	9

Junior – Autumn		Junior – Winter		Junior – Spring		Junior - Summer	
BIOEN 325 – Biotransport I	3	BIOEN 335 -Biotransport II	3	BIOEN 345 - Failure Analysis of Human Physiology, with Lab	4	BIOEN 402 or 403	var*/2
BIOEN 326 – Solid and Gel Mechanics	3	BIOEN 336 – Bioengineering Systems and Control	3	BIOEN 401 - BIOE Capstone Fundamentals	3	Recommended early start option	
BIOEN 327 - Fluids & Materials Lab	2	BIOEN 337 – Mass Transport and Systems Lab	2	Bioengineering Elective	3		
STAT 390/Ind E 315	3	ENGR Elective	3	ENGR Elective	3		
VLPA/I&S	5	VLPA/I&S	5	VLPA/I&S	3		
QUARTER TOTAL	16	QUARTER TOTAL	16	QUARTER TOTAL	16		2

Senior – Autumn		Senior – Winter		Senior – Spring		Senior - Summer	
BIOEN 402 or BIOEN 403 Capstone	var*/2	BIOEN 402 or 404 Capstone	var*/2+3	BIOEN 402 or 405 Capstone	var*/2+3		
BIOEN Concentration –Elective 1	3	BIOEN Concentration–Elective 2	3	BIOE Emphasis – Elective 3	3		
BIOC 405	3	BIOC 406	3	VLPA/I&S	5		
BIOEN Elective	3	ENGR Elective	3	PHYS 123	5		
VLPA/I&S	5						
QUARTER TOTAL	16	QUARTER TOTAL	12	QUARTER TOTAL	16		

*Two capstone concentration: BIOEN 402, for a total of 10 credits or; BIOEN 403 (2+2), BIOEN 404 (3) and BIOEN 405 (3), for a total of 10 credits.

Total Degree Credits: 197 (180 for the BS BIOE + 17 credits of extra pre-medical sciences)

Prerequisites to BIOE core courses, proposed curriculum

Year	Quarter	Course #	Course Title	Pre-reqs
FR	WIN	BIOEN 215	BIOE Problem-Solving	none
SOPH	SPR	BIOEN 315	Biochemical and Molecular Engineering	CHEM 223 or 237 BIOL 180; BIOL 200 co-req
SOPH	SPR	BIOEN 316	Signals and Sensors	AMATH 301 MATH 307 co-req PHYS 122 BIOEN 317 co-req
SOPH	SPR	BIOEN 317	Biomedical Signals and Sensors Lab	co-req with 316 & 315
JR	AUT	BIOEN 325	Biotransport I	AMATH 301 MATH 307 PHYS 122 BIOL 220
JR	AUT	BIOEN 326	Solid and Gel Mechanics	BIOEN 315 PHYS 122 CHEM 142, 152, & 162
JR	AUT	BIOEN 327	Fluids and Biomaterials Lab	Co-req with BIOEN 325 and 326
JR	WIN	BIOEN 335	Biotransport II	MATH 307 BIOEN 325
JR	WIN	BIOEN 336	BIOE Systems and Control	MATH 307 PHYS 122 MATH 307 & 308 AMATH 301
JR	WIN	BIOEN 337	Mass Transport and Systems Lab	BIOEN 327 co-req BIOEN 335 and 336 co-req STAT 390 or IND E 315
JR	SPR	BIOEN 345	Failure Analysis of Human Physiology	BIOEN 215 STAT 390 or IND 315 BIOEN 335, 336, 337 BIOL 220
JR	SPR	BIOEN 401	Capstone Fundamentals	Senior standing in BIOEN 326
SR	AUT ff	BIOEN 402		BIOEN 401
SR	AUT ff	BIOEN 403		BIOEN 401
SR	WIN	BIOEN 404		BIOEN 401
SR	SPR	BIOEN 405		BIOEN 404

For more information, please contact:

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Options for Undergraduate Transfer to UW BS Bioengineering program

Option 1: Transfer to UW Spring Quarter of Sophomore year

	AUT	WIN	SPR	SUM	Notes:
Yr 1	CHEM 142 MATH 124 ENGL Comp	CHEM 152 MATH 125	CHEM 162 MATH 126	AMATH 301 At UW if not available at CC.	Register for AMATH 301 at UW via Educational Outreach. Check your CC for a similar course. If your CC allows you to take Biology in the freshman year, begin then.
Yr 2	Apply to UW for SPR quarter admissions by 9/15 PHYS 121 o-chem BIOL 1	Apply to BIOE by 2/1 PHYS 122 MATH 307 BIOL 2	Matriculate UW, declare BIOE BIOEN 315, 316, 317 MATH 308 BIOL 3 at CC or UW	BIOEN 215 to be taken AUT qtr of jr year BIOE will accept 2 qtrs of transfer Biology plus a third quarter of Biology at UW	

Option 2: Transfer to UW Fall Quarter of Junior Year

	AUT	WIN	SPR	SUM	Notes:
Yr 1	CHEM 142 MATH 124 ENGL Comp	CHEM 152 MATH 125	CHEM 162 MATH 126		If your CC requires preparatory Chem and Math, continue the calculus and chem sequences into the summer.
Yr 2	PHYS 121 o-chem BIOL 1	Apply to UW for AUT quarter by 2/15PHYS	MATH 308 BIOL 3		You may take AMATH 301 at your CC if offered there.

Yr 3	Matriculate at UW BIOEN 215 AMATH 301 if not taken previously BIOEN 299 (elective) Statistics	Apply BIOE by 2/1 HCDE 231 Approved ENGR electives Gen ed as needed BIOEN 499 (Elective research)	Declare BIOE BIOEN 315, 316, 317 Approved ENGR elective OR Gen ed as needed		
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BIOE 1503 questions from SCAP
Monday June 7, 2010

SCAP would like more information before they make their recommendation to FCAS this week and they will need a response by noon on Tuesday.

- 1) Please provide the anticipated 4 year plan for native and transfer students under the proposed curriculum.

See attached curriculum handout for 4-year plan. See attached excel handout for transfer options.

Please note that most of our transfer students have typically entered UW Autumn quarter and entered the Department the following spring. Transfers usually still have prerequisite courses to complete at the University prior to starting the BIOE core (often because they have either not started immediately with science classes, or they have started with pre-calculus, introductory chemistry, and introductory computer science prior to beginning the courses required by the major). Although my "junior year transfer option" schedule shows them into required engineering electives in fall and winter of the junior year, it is more likely that they will be finishing our prerequisites.

- 2) How many transfer students are in your program?

Ten.

- 3) Will your new curriculum require transfer students to transfer before they finish their AA in order to graduate in 4 years?

To finish in 4 years they would need to transfer to UW no later than the spring of the sophomore year. If the AA were not finished at that point, they would transfer without it.

Please note that the BS BIOE program has always had a spring start (spring quarter of the sophomore year). This has been true since the program's inception 10 years ago. CHEM E recently changed their program sequence and start time to mirror ours.

- 4) How often are BIOEN 215 and AMATH 301 offered each year at the UW?

BIOEN 215 will be offered once a year. In the coming academic year it will be offered WIN 11. In subsequent years our intention is to move it to Autumn quarter (a result of juggling our available teaching staff). Please note that BIOEN 215 is not a prerequisite to apply to the BIOE program, nor is it a prerequisite to begin the junior core. This was done intentionally to allow transfer students who begin at UW Spring quarter to defer 215 until Autumn quarter of the junior year. We are working hard to schedule this course in such a way that freshmen, sophomores, and bioe juniors can take it. This represents a BIG improvement for transfer students. The prior introductory course, BIOEN 201, was a prerequisite to

the first core course, and was offered winter quarters only. Students who wanted to transfer in mid-year either had to enter UW for winter quarter or take BIOEN 201 via Ed Outreach. Students will now be able to enter UW for spring quarter, provided they have been able to take AMATH 301.

AMATH 301 is currently offered all four quarters at UW and is not considered an "impacted" course. Therefore it should be available via Educational Outreach to prospective transfers.

We have been informed by the College that Everett CC is developing an on-line version of AMATH 301. In addition, we have been told that other community colleges will likely develop an equivalent course because it is required by Washington State University's engineering programs as well as an increasing number of engineering programs at UW.

- 5) Can transfer students apply for both Spring and Autumn admissions and still graduate on time?

NO. Spring start only. We teach our core courses once per year.

In the past we have allowed upper applicants to apply in July provided they took our intro courses (201 and 301) and were on track to continue with the junior cohort. Over the years we have admitted probably half a dozen incoming transfer students at that point, even though they needed to wait until spring to begin the core. CHEM E has eliminated Autumn admission for Upper Division students and Bioengineering needs to consider doing the same. It would avoid confusion for students. Properly viewed, July admission is for Early Admission and February admission is for Upper Admission.

- 6) Have you communicated or discussed your proposed changes with the community colleges where the majority of your transfer students come from?

I need to defer some part of this answer to Dr. James Bryers, who met with John Sahr quite some time ago to discuss this issue.

For the past academic year the information has been listed on our website with a note that the curriculum is changing for students who were freshmen during the 09-10 academic year. This Spring we admitted our last group of students who will be graduated under the old curriculum. Our website it now being updated to display the new curriculum only.

- 7) Are you aware the students already admitted to your program have 10 years to finish the major under the old requirements? What is your teach out plan for these students?

This should not be an issue for us. The College of Engineering departments have fairly specific satisfactory progress/continuation policies in place in keeping with college rules; ours is fairly strict. The revised continuation policy was included with the 1503 and new course aps we sent through the college. The only change to the continuation policy is to update the course numbers; there is no change to actual policy.

We track our students and manage them by cohort. They are required to take full loads, move straight through the core as a cohort, and work on their capstone projects without interval they are completed. The continuation policy also states, "A student who withdraws from the University or from a required bioengineering course or whose quarter schedule is cancelled for non-payment of fees must obtain permission from the Department before registering for subsequent bioengineering courses." This is in line with college policy. Our students move through and finish. Any exceptions (illness, finances, etc.) are subject to a petition to the faculty. Right now any such approval would entail the student switching to the new curriculum.

The shape of the new curriculum is strongly influenced by the past several graduating cohorts of students and their advice to us. The new curriculum is the subject of envy amongst our seniors and juniors, who would have preferred it to the one they are completing.

Current sophomores (juniors AUT 10) have begun the old curriculum; they will be the last cohort through on that curriculum.

We met with our incoming freshmen prior to the start of Autumn Quarter 2010 and advised them about the new curriculum. They are proceeding to complete the new requirements. Several students who entered with enough credit to move into the sophomore cohort instead opted to drop back to the freshman cohort so they could be educated under the new curriculum.

We are not admitting freshmen directly AUT 10.

We therefore think that someone invoking the 10-year rule would be a VERY unlikely scenario for us. A possible scenario might be if one of next year's juniors needed to drop out of the University in the middle of the junior core, then returned to UW later and petitioned the department to be a) readmitted and b) allowed to finish under the old curriculum. *If* the petitions were granted, we would work out an individualized plan for that student, identifying a combination of courses currently offered inside and outside the department that would convey roughly the same information and meet our accreditation requirements. The only issue would be creating a plan to finish the old core; it is easy to be flexible about senior elective credit and we will have more course options in the future that would work.

6) Have you communicated or discussed your proposed changes with the community colleges where the majority of your transfer students come from?

Yes. Their major concern was the shift away from a math pre-requisite that stressed JAVA-based language programming (CSE 142) to one that stresses MATLAB programming (AMATH 301). This is a change that a majority, if not all of the college of Engineering has either completed or are in the process of changing.

Most of the community colleges we contacted were rightfully concerned that they would be forced to provide one or more MATLAB preparatory courses, which would require the CC's to purchase an extortionately expense MATLAB site license.

We have provided each of the 10 colleges we spoke to on-line internet locations where they could download FREE Matlab-like software that could be used to provide the courses that they were planning. Prior to such course development at the regional CC's, the CSE department has also proffered to develop a MATLAB remedial course for transfers.

Transfers will be in essentially in no worse shape under this new curriculum than they were under the old. Under the old curriculum they had to be here Winter quarter to take 201 and apply, or they had to take 201 via extension. Under the new curriculum they need to be here in the Winter to take AMATH 301, or they need to take it through extension. So if the CC's develop a Matlab-like course, the situation becomes easier with the new curriculum, not worse. Because most transfers are here AUT-WIN (applying to BIOEN during WIN), our proposed change will not be that significant.