

05/02/2016



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Establish three transcriptable concentrations, General Bioengineering, Bioinstrumentation and Computational Genomics, under the major in Bioengineering in the Department of Bioengineering, College of Engineering for the degree of Master of Engineering.

SPONSORS: Rashid Bashir, Abel Bliss Professor of Engineering and Head, Department of Bioengineering, 217-333-1867, rbashir@illinois.edu

COLLEGE CONTACT: Bill Buttlar, Associate Dean, Graduate, Professional, and Online Programs, College of Engineering, 217-333-0678, buttlar@illinois.edu

BRIEF DESCRIPTION:

The Department of Bioengineering seeks to establish three transcriptable concentrations, General Bioengineering, Bioinstrumentation and Computational Genomics, under the major in Bioengineering for the degree of Master of Engineering (M.Eng.). Each concentration will have a core set of requirements that meet the minimum requirements for the M.Eng. in Bioengineering listed below. Please see Appendix A for details on each core concentration.

- Minimum of 32 credit hours.
- A minimum of 18 hours of Bioengineering coursework.
- A minimum of 8 hours elective coursework.
- A minimum of 6 hours of professional development. This can be fulfilled through a project, an internship, or a business-oriented course.
- Students must complete a minimum of 12 hours of 500-level coursework
- Students must select the concentration track they plan to complete at the time of admission. Students cannot complete multiple concentrations.

Once the M.Eng. in Bioengineering proposal is approved as well as these concentrations in this proposal, the department will submit a proposal seeking to terminate the current Master of Engineering in Bioinstrumentation, since the department is proposing bioinstrumentation as one of the transcriptable concentrations, which is intended to replace this program.

JUSTIFICATION:

General Bioengineering Concentration

As the global healthcare system is undergoing transformation driven largely by an aging population, there is greater need for technological advances in medicine and bioengineering that will provide better healthcare at a lower cost. Industry also desires new graduates with knowledge of business issues that are rarely discussed in the undergraduate curriculum. Typical recent graduates lack the “big picture” understanding of the industry and thus may be limited in their ability to find creative solutions to some problems.

Hiring managers are also looking for engineers who show leadership potential, since it is common for engineers to work in team projects that require effective communication skills, the ability to resolve conflict within a team structure and project management skills.

The concentration in General Bioengineering is designed to bridge this skills gap by developing students with deeper understanding of general bioengineering concepts and more business acumen through coursework and an applied consulting project. The project will provide an opportunity for applied consulting work, exposing them to real-world industry issues.

Bioinstrumentation Concentration

Bioinstrumentation currently underlies many of the most important developments that will impact our health, and are expected to continue to do so. Bioinstrumentation is central to all modes of biomedical imaging, point-of-care diagnostics, personalized medicine, high throughput genome sequencing, life science research, environmental monitoring, and biowarfare defense. As a result of this success, the Department of Bioengineering anticipates a growing need for engineers who require deeper knowledge of Bioinstrumentation fundamentals in preparation for careers in industry, national laboratories, health policy, medical research, and medical practice.

Discussions with human resource managers and engineering managers within large companies who recruit BS students in Bioengineering have expressed a desire for students to acquire not only greater technical depth, but also to develop the leadership and project management skills required to bring bioinstrumentation products to market in the demanding regulatory environment for these products. This concentration is designed to serve the needs of students who seek careers that combine engineering with product/team/project management in the rapidly growing fields of biomedical imaging, life science research, genomics, and diagnostics.

Computational Genomics Concentration

In the 2015 State of the Union Address, President Obama announced the establishment of a new “Precision Medicine” initiative that will aim to deliver the right treatment to the right patient at the right time in the near future. The ultimate goal is to draw on vast amounts of data from basic research, medical records, and other information from the individual patient to develop more-targeted therapies and diagnostics and inform decisions about individual patient care. It is clear that precision medicine will enable the much needed paradigm shift in health care in this country in the next decade.

There is growing need in major employers including pharmaceutical industry, biotech companies, agricultural industry, and numerous emerging startup companies related to personalized genomics. Several major IT companies such as Google and Microsoft have also started to invest in computational genomics. We anticipate a growing need for engineers who require deep knowledge of genomic biology with strong computational skills in preparation for careers in industry, national laboratories, health care industry, medical research and practice.

Our program will provide a combination of data science education (statistical inference, data wrangling, computer algorithms and programming, machine learning, and data management) within the context of real-world biomedical problem. In addition to scientific problem-solving skills, the program will also train students to become bioinformatics professionals with business proficiency such as project management, teambuilding, and communications experience in a team-based working environment.

BUDGETARY AND STAFF IMPLICATIONS: *(Please respond to each of the following questions.)*

1) Resources

- a. How does the unit intend to financially support this proposal?

The M.Eng in Bioengineering is proposed to be a self-supporting program. These three concentrations will follow the financial model as outlined in that proposal. Tuition funds returned to the sponsoring departments will be used to cover the costs of developing required courses, and to compensate faculty and visiting lecturers who deliver course modules. In addition, funds will be used to market the program for recruitment purposes, support of co-curricular activities, honoraria for industry instructors, travel reimbursement for guest lecturers, supporting the Industry Advisory Board meeting and other miscellaneous administrative costs associated with running an academic program. Funds will also be used to support one or two additional academic professional staff personnel.

These concentrations will fall under the standard tuition and fee rate for Graduate and Professional programs in the College of Engineering plus a \$2,000 program fee for students. No financial assistance will be available and students will be responsible to pay the tuition and fees for the program. As the program grows, the department will explore the possibility of establishing corporate scholarships to help well-qualified students.

- b. How will the unit create capacity or surplus to appropriately resource this program? If applicable, what functions or programs will the unit no longer support to create capacity?

We anticipate that the impact to the unit will be minimal. Any additional staffing that may be needed will be supported through the tuition funding from the program.

- c. Will the unit need to seek campus or other external resources? If so, please provide a summary of the sources and an indication of the approved support.

With the number of course options in the elective area, it is not anticipated that additional course sections will be needed to accommodate the students in this major. The students will work with their advisors to select applicable courses that have open enrollment availability.

- d. Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.

See attached MOU Agreement between the College of Engineering and Bioengineering.

2) Resource Implications

- a. Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.

The projected enrollment in the program is expected to be relatively modest at the launch, with no more than 25 students anticipated in the first year across all concentrations. The projected enrollment is not expected to significantly impact course enrollments across campus. Tuition funds and the program fee returned to the department will be used to hire teaching assistants and/or to support additional sections of courses if needed. We hope to grow the program to 40-50 students across all concentration areas in steady state, which we hope to reach by the 4th year.

It is anticipated that some funds will need to be allocated during the first two years of the program for the development of new courses. Because this is a self-supporting program, funds for the development of courses will come from tuition dollars generated by enrollments in this curriculum. A financial arrangement between the Bioengineering department and the College of Engineering has been made to allow the unit to borrow against future earnings for the purpose of curriculum development. Thus, this program will not involve the direct use of campus-level resources for curriculum development or the delivery of instruction.

- b. Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units. (*A letter of acknowledgement from units impacted should be included.*)

The program is not anticipating any significant impact on the enrollment in other units. The program will also follow the established tuition distribution model for elective courses taken outside of the bioengineering department.

- c. Please address the impact on the University Library (*A letter of estimated impact from the University Librarian must be included for all new program proposals. If the impact is above and beyond normal library business practices, describe provisions for how this will be resourced.*)

No significant impact on the University Library. See attached letter.

- d. Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.)

No significant impact on computer use, laboratory use, or equipment is expected.

For new degree programs only:

- 3) Briefly describe how this program will support the University’s mission, focus, and/or current priorities. Include specific objectives and measurable outcomes that demonstrate the program’s consistency with and centrality to that mission.

The M.Eng. in Bioengineering program, which is where three concentrations are housed under, is consistent with the University’s mission to serve the state, the nation, and the world, preparing students for impactful lives through the transfer and application of knowledge.

The proposed bioinstrumentation concentration will provide graduate students with more in-depth understanding of the underlying physical principles of biological detection, data/image/signal processing methods, molecular/cellular biology, bioinformatics, and instrumentation design than are available in an undergraduate curriculum.

The proposed computational genomics concentration will provide graduate students with more in-depth understanding of the underlying principles of data interpretation and management of genomic data. In addition, the program will provide training in designing appropriate data analytical approaches.

The proposed general bioengineering concentration will provide graduate students with more in-depth understanding of various multidisciplinary engineering fields, such as bioinstrumentation, biomaterials, biomechanics, bioinformatics, nano-medicine and synthetic biology. The board range of courses offered allows for customization of the curriculum through multiple tracks that enable students to focus their experience within their field of greatest interest.

- 4) Please provide an analysis of the market demand for this degree program. What market indicators are driving this proposal? What type of employment outlook should these graduates expect? What resources will be provided to assist students with job placement?

State of Illinois

Occupational Title	2010 Est. Employment	2020 Proj. Employment	Total 2010-2020 Employment Change	Annual Avg. Percent Change	Total Percent Change
Bioengineers	706	1,064	358	5.07%	50.71%

National Employment Outlook (17-2031 SOC code):

Occupational Title	2012 Est. Employment	2022 Proj. Employment	Total 2012-2022 Employment Change	Annual Avg. Percent Change	Total Percent Change
Bioengineers	19,400	24,600	5,200	2.7%	27.00%

The employment growth projected for bioengineers is considered higher than average. As cited in the Bureau of Labor Statistics, demand for bioengineers will be strong because an aging population is likely to need more medical care and because of increased public awareness of biomedical engineering advances and their benefits. In addition, because bioengineering is a multidisciplinary field, the actual job outlook spans more than one occupational classification, not just bioengineering. We anticipate a strong need for highly trained students and future managers who can combine technical skills with business acumen, critical thinking, and global awareness.

Growth is projected in emerging countries, primarily Brazil, Russia, India, South Africa, and China, as major healthcare reforms are being implemented in these markets, resulting in the transformation of global health and an increase in bioengineering-related jobs.

The targeted enrollment numbers for these three concentrations are modest and not expected to produce a great influx of additional candidates on the market. The Department of Bioengineering expects the majority of these students to be students who choose to delay entry into the job market to gain competitive skills or early career professionals who need to update their skills to retain their existing employment or prepare for advancement.

Existing campus resources and activities through the Engineering Career Services, Career Center, as well as the Grad College will support students during their job search.

- 5) If this is a proposed graduate program, please discuss the programs intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

The M.Eng. in Bioengineering major has a self-supporting status, which will apply to these transcriptable concentrations. There are no Graduate College or BOT waivers allowed for students in this program.

DESIRED EFFECTIVE DATE: *(Proposals may not be implemented until they go through all necessary levels of approval. The Provost's office will inform the sponsors in writing when they may implement their proposal. Proposed changes may not be publicized as final on any web sites, printed documents, etc. until written confirmation of final approval is issued.)*

Fall 2017 or sooner upon approval

STATEMENT FOR PROGRAMS OF STUDY CATALOG: *(All proposals must include either a new or revised version of the entry in the Programs of Study Catalog, if applicable. Entries will be published as approved by the Senate. Future changes in the statement for Programs of Study Catalog which reflect changes in the curriculum, must go through the normal review process at the appropriate levels.)*

See Appendix B

CLEARANCES: (Clearances should include signatures and dates of approval. These signatures must appear on a separate sheet. If multiple departments or colleges are sponsoring the proposal, please add the appropriate signature lines below.)

Signatures:



10-8-2015

Unit Representative:

Date:

College Representative:

Date:



Graduate College Representative:

3/31/16

Date:

Council on Teacher Education Representative:

Date:

Appendix A: Course Requirements and Program Administration

A. General Bioengineering Concentration

Requirements for General Bioengineering Concentration	
Credit Hours	Hours
<ul style="list-style-type: none"> • Core Concentration <ul style="list-style-type: none"> ○ Technical Coursework from approved list ○ Business Coursework from approved list 	18
<ul style="list-style-type: none"> • Elective Courses chosen in consultation with advisor 	8
<ul style="list-style-type: none"> • Professional Development from approved list 	6
Total Coursework Hours	32

Technical Coursework (10 credit hours)

- BIOE 570 A – Seminar series (2 credit hours)
- Choose 2 BIOE 400- or 500-level courses in consultation with advisor (8 credit hours – see list below, which additional courses may be added as they are made available by the department)

Imaging and Sensing

- BIOE 498/598 – Special Topics (will vary per semester)

Computational and Systems Biology

- BIOE 498/598 – Special Topics (will vary per semester)

Biomechanics

- BIOE 461 – Cellular Biomechanics

Therapeutics

- BIOE 498/598 – Special Topics (will vary per semester)

Cell and Tissue Engineering

- BIOE 416 – Biosensors
- BIOE 473 – Biomaterials Laboratory
- BIOE 461 – Cellular Biomechanics
- BIOE 498/598 – Special Topics (will vary per semester)
- BIOE 476 – Tissue Engineering
- BIOE 479 – Cancer Nanotechnology
- BIOE 482 – Musculoskeletal Tissue Mechanics

Business Coursework (8 credit hours)

- BIOE 573 – Systems Engineering
- BIOE 574 – Innovation

Professional Development (6 hours)

- BIOE 575 – Team Project

The team project will provide professional development and is designed to allow students to gain an applied team-based consulting experience where they will use principles learned during coursework to solve an industry related problem. Teams will have access to a project contact within the company to consult. They will provide a written report as well as formal presentation that describes the nature of the problem, their derived milestone, alternative approaches considered, details on the implemented approach, and the design and analysis used with the proposed solution. Students will be evaluated on their report and presentation for a grade and will receive both oral and written feedback.

On a case-by-case basis, students with internships may be allowed to work on an independent study project for their employer. Each situation will be evaluated and subject to approval by the appropriate program faculty director and the student’s internship supervisor. A clear project scope and outcome must be outlined at the onset to make sure the independent study project is in line with the learning objectives of the class. The student will still be required to do a written as well as formal presentation at the conclusion of their independent study project for a grade.

B. Bioinstrumentation Concentration

Requirements for Bioinstrumentation Concentration	
Credit Hours	Hours
<ul style="list-style-type: none">• Core Concentration<ul style="list-style-type: none">○ Technical Coursework from approved list○ Business Coursework from approved list	18
<ul style="list-style-type: none">• Elective Courses chosen in consultation with advisor	8
<ul style="list-style-type: none">• Professional Development from approved list	6
Total Coursework Hours	32

Technical Coursework (10 credit hours)

- BIOE 570 B – Seminar series (2 credit hours)
- BIOE 571 – Biological Measurement I (4 credit hours)
- BIOE 572 – Biological Measurement II (4 credit hours)

Business Coursework (8 credit hours)

- BIOE 573 –Systems Engineering
- BIOE 574 –Innovation

Professional Development (6 hours)

- BIOE 575 – Team Project

The team project will provide professional development and is designed to allow students to gain an applied team-based consulting experience where they will use principles learned during coursework to solve an industry related problem. Teams will have access to a project contact within the company to consult. They will provide a written report as well as formal presentation that describes the nature of the problem, their derived milestone, alternative approaches considered, details on the implemented approach, and the design and analysis used with the proposed solution. Students will be evaluated on their report and presentation for a grade and will receive both oral and written feedback.

On a case-by-case basis, students with internships may be allowed to work on an independent study project for their employer. Each situation will be evaluated and subject to approval by the appropriate program faculty director and the student’s internship supervisor. A clear project scope and outcome must be outlined at the onset to make sure the independent study project is in line with the learning objectives of the class. The student will still be required to do a written as well as formal presentation at the conclusion of their independent study project for a grade.

C. Computational Genomics Concentration

Requirements for Genomics Concentration	
Credit Hours	Hours
<ul style="list-style-type: none"> • Core Concentration <ul style="list-style-type: none"> ○ Technical Coursework from approved list ○ Business Coursework from approved list 	18
<ul style="list-style-type: none"> • Elective Courses chosen in consultation with advisor 	8
<ul style="list-style-type: none"> • Professional Development from approved list 	6
Total Coursework Hours	32

Technical Coursework (10 credit hours)

- BIOE 570 C – Seminar series (2 credit hours)
- BIOE 582 – High-throughput Genomics Data Analysis (4 credit hours) (new course being proposed)
- BIOE 583 – Algorithms, Statistics and Modeling (4 credit hours) (new course being proposed)

Business Coursework (8 credit hours)

- BIOE 573 –Systems Engineering
- BIOE 574 –Innovation

Professional Development (6 hours)

- BIOE 575 – Team Project

The team project will provide professional development and is designed to allow students to gain an applied team-based consulting experience where they will use principles learned during coursework to solve an industry related problem. Teams will have access to a project contact within the company to consult. They will provide a written report as well as formal presentation that describes the nature of the problem, their derived milestone, alternative approaches considered, details on the implemented approach, and the design and analysis used with the proposed solution. Students will be evaluated on their report and presentation for a grade and will receive both oral and written feedback.

On a case-by-case basis, students with internships may be allowed to work on an independent study project for their employer. Each situation will be evaluated and subject to approval by the appropriate program faculty director and the student’s internship supervisor. A clear project scope and outcome must be outlined at the onset to make sure

the independent study project is in line with the learning objectives of the class. The student will still be required to do a written as well as formal presentation at the conclusion of their independent study project for a grade.

PROGRAM ADMINISTRATION

Each concentration attached to the M.Eng. in BioE will have its own “Program Director”, which will be a faculty member in the Department of Bioengineering or affiliated with the department. The Program Director will be responsible along with a small committee to review all applications and make admission decisions. All applicants will be required to meet the admission requirements required by the Graduate College and the Department of Bioengineering. Applicants will be required to select a concentration at the time of admissions and will not be able to complete multiple concentrations.

Because the focus of the program is the development of engineers who will work in industry, each concentration will have its own Industry Advisory Board (IAB), who will be consulted on a continuous basis regarding the program curriculum to ensure that the program continues to meet the technical and professional needs of industry. They might also be invited as guest class speakers to discuss real world issues pertaining to the health care and the bioengineering industries. Additionally, an annual IAB meeting will be held on the Illinois campus in conjunction with the presentation of project progress report presentations, so as to provide opportunities for the IAB to interact with students directly.

Appendix B: Statement for the Programs of Study Catalog

Master of Engineering in Bioengineering Bioengineering

bioengineering.illinois.edu

Head of Department: Rashid Bashir

Director of Graduate Studies: Deborah Leckband

Academic Program Contacts: Liezl Bowman (Program Coordinator)

1270 Digital Computer Laboratory

1304 West Springfield Avenue

Urbana, IL 61801

(217) 333-1867

E-mail: liezlb@illinois.edu

Major: Bioengineering

Degrees Offered: M.Eng.

Graduate Degree Programs

The Department of Bioengineering offers studies leading to the Master of Engineering in Bioengineering. For more information, visit bioengineering.illinois.edu.

Admission

Students must select one of the concentrations under the M.Eng. in Bioengineering program to apply to and will not be able to complete multiple concentrations. Students should have an undergraduate degree in science related field or must have taken engineering or science related coursework. Applicants should have a minimum grade point average of 3.00 (A = 4.00) or equivalent for the last two years of undergraduate study and show evidence of strong quantitative skills and of serious interest in the life sciences. In addition, applicants must submit results from the Graduate Record Examination (GRE) general test. Students in the program are not expected to continue in and do not have automatic admission to the Ph.D. program in any engineering department.

All applicants whose native language is not English must submit a minimum TOEFL score of 103 (iBT), 257 (CBT), or 613 (PBT); or minimum International English Language Testing System (IELTS) academic exam scores of 7.0 overall and 6.0 in all subsections. Applicants may be exempt from the TOEFL if certain criteria are met. Applicants with lesser scores may still apply. Limited status is granted for lesser scores and requires enrollment in English as a Second Language (ESL) courses based on an ESL Placement Test (EPT) taken upon arrival to campus.

Degree Requirements

*For additional details and requirements for all degrees, please refer to the department's Graduate Studies Web site and the Graduate College Handbook.

Master of Engineering in Bioengineering with a General Bioengineering Concentration

Requirements	
Credit Hours	Hours
Total Credits for the Degree	32
Course Work	
<ul style="list-style-type: none"> • Core Concentration <ul style="list-style-type: none"> ○ Technical Coursework from approved list ○ Business Coursework from approved list 	18
<ul style="list-style-type: none"> • Elective Courses chosen in consultation with advisor 	8
<ul style="list-style-type: none"> • Professional Development from approved list 	6
Other Requirements and Conditions (may overlap):*	
A minimum of 20 credit hours must be taken from the University of Illinois at Urbana-Champaign campus.	
A minimum of 12 500-level credit hours overall.	
The minimum program GPA is 3.0.	
At most, 12 credit hours of previous University of Illinois Urbana-Champaign graduate-level coursework not applied to any other degree may be transferred and applied to the major pending department and Graduate College approval.	

Master of Engineering in Bioengineering with a Concentration in Bioinstrumentation

Requirements	
Credit Hours	Hours
Total Credits for the Degree	32
Course Work	
<p>Core Courses:</p> <p>Complete the required courses in each of the areas below.</p> <ul style="list-style-type: none"> • Technical courses from approved list • Business courses from approved list 	18
<ul style="list-style-type: none"> • Elective Courses chosen in consultation with advisor 	8
<ul style="list-style-type: none"> • Professional Development courses from approved list 	6
Other Requirements and Conditions (may overlap):*	

A minimum of 20 credit hours must be taking from the University of Illinois Urbana Champaign campus.
A minimum of 12 500-level credit hours overall.
The minimum program GPA is 3.0.
At most, 12 credit hours of previous University of Illinois Urbana-Champaign graduate-level coursework not applied to any other degree may be transferred and applied to the major pending department and Graduate College approval.

Master of Engineering in Bioengineering with a Concentration in Computational Genomics

Requirements	
Credit Hours	Hours
Total Credits for the Degree	32
Course Work	
Core Courses: Complete the required courses in each of the areas below. <ul style="list-style-type: none"> • Technical courses from approved list • Business courses from approved list 	18
<ul style="list-style-type: none"> • Elective Courses chosen in consultation with advisor 	8
<ul style="list-style-type: none"> • Professional Development courses from approved list 	6
Other Requirements and Conditions (may overlap):*	
A minimum of 20 credit hours must be taking from the University of Illinois Urbana Champaign campus.	
A minimum of 12 500-level credit hours overall.	
The minimum program GPA is 3.0.	
At most, 12 credit hours of previous University of Illinois Urbana-Champaign graduate-level coursework not applied to any other degree may be transferred and applied to the major pending department and Graduate College approval.	

Financial Aid

The tuition and fees for the M.Eng. in Bioengineering are the standard Graduate and Professional Programs rates for the College of Engineering, plus a \$2000 program fee. For tuition information and external funding resources, please visit bioengineering.illinois.edu. Students in the M.Eng. in Bioengineering program are not eligible for tuition-waiver generated assistantships.



**REQUEST & JUSTIFICATION FORM FOR PROGRAM CLASSIFICATION
TRADITIONAL, SELF-SUPPORTING or REIMBURSABLE**

CURRENT PROGRAMS:

Current graduate programs can request a change in classification to Traditional or Reimbursable, but not to Self-supporting.

NEW PROGRAMS:

New programs seeking Traditional classification do not need to complete this form.

New programs seeking Self-supporting classification should be aware of the following:

- a) Students enrolled in Self-supporting programs are ineligible to hold waiver-generating appointments. **NOTE:** There is no mechanism within the Human Resources Front End system that restricts the appointment of a Self-supporting program student to an assistantship. Therefore, if a unit (faculty or staff) appoints a student, in error, significant problems result for everyone involved.
- b) Self-supporting status results in reduced flexibility for the program. Even if a student in the program is most qualified for a particular assistantship appointment and financing is available through the program, the program status makes the student ineligible.
- c) Because Traditional, Reimbursable and Self-supporting programs each yield 90% of net tuition, and the Reimbursable classification avoids the limitations above, a program might find the Reimbursable classification more advantageous than Self-supporting.

Please contact the Fellowship Office at the Graduate College if you have questions or seek clarifications, (217) 333-0036 or gradfellowships@illinois.edu.

COLLEGE OR SCHOOL: Department of Bioengineering

IS THIS A NEW OR EXISTING PROGRAM:

New Program

Existing Program

Program Code: _____ Current Classification: _____

REQUESTED CLASSIFICATION: TRADITIONAL REIMBURSABLE SELF-SUPPORTING

JUSTIFICATION: On a separate sheet, please address the following.

1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.
2. Describe the expected impact of the requested classification to new students. How will these measures affect the affordability of the program? What type of financial aid, if any, will be offered? Note: Continuing students will not be affected as they are subject to the rules in effect at the time of their admission.
3. What provisions will be made to communicate the implications of the classification to prospective and newly admitted students?
4. Name the college and program contact persons in charge of implementing and communicating the classification and its consequences to students.

Unit Head Signature and Date  10/5/15

College Dean Signature and Date _____

- 1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.**

This is a request to establish self-supporting status for a new degree program (Master of Engineering in Bioengineering – M.Eng. BIOE). The total enrollment in this professional degree program is projected to be approximately 25, representing a fraction of the total enrollment (currently approximately 72) in the BIOE graduate programs. As such, there will not be any significant impact on class sizes for current or future graduate students in the existing M.S. and Ph.D. programs, since BIOE courses that overlap these programs are minimal. Designating this new program as self-supporting will not have any impact on admissions standards for the M.Eng. or existing M.S. and Ph.D. programs. The program will generate new revenue for the BIOE Department, enabling us to increase the level of TA and grader support for all graduate courses. We expect that establishment of the self-supporting MEng degree will increase the quality of the educational experience in all graduate degree programs within BIOE.

- 2. Describe the expected impact of the requested classification to new students. How will these measures affect the affordability of the program? What type of financial aid, if any, will be offered? Note: Continuing students will not be affected as they are subject to the rules in effect at the time of their admission.**

The M.Eng. is a new program. No change that would affect any current or future students in the existing M.S. or Ph.D. degree programs is proposed. All students entering the new M.Eng. program will need to pay tuition. We do not intend to offer financial aid to any students who are enrolled in the M.Eng program.

- 3. What provisions will be made to communicate the implications of the classification to prospective and newly admitted students?**

The self-supporting nature of the program will be clearly explained on the program's website and in any and all communications to prospective students.

- 4. Name the college and program contact persons in charge of implementing and communicating the classification and its consequences to students.**

The M.Eng. BIOE is a new program. No changes are being requested. Professor Rashid Bashid, Department Head, Professor Dipanjan Pan, BIOE Assistant Professor, Dr. Victor Jongeneel, Senior Research Scientist for Supercomputing Applications and Ms. Liezl Bowman, Academic Program Coordinator will be responsible for communicating with prospective students. The College of Engineering contacts for this program are Associate Dean William G. Buttlar and Director of Graduate Programs Rhonda Kay McElroy.

MEMORANDUM OF UNDERSTANDING BETWEEN THE

COLLEGE OF ENGINEERING (CoE)

AND THE

DEPARTMENT OF BIOENGINEERING (BioE)

For the distribution of tuition funds for tuition-generating enrollments in the
Professional Master's degree program in BioE

This MOU applies to tuition paying M.Eng. Bioengineering students in the BioE Department and establishes a formula for the transfer of tuition funds between the CoE and BioE. This is a new agreement, which follows the CoE Guidance Document for Professional Master's Program Tuition Sharing ratified in July 2014. This agreement is not applicable to online programs or enrollments.

- For tuition generated by BioE self-supporting M.Eng. students, net tuition funds (those returned to the CoE from campus) will be split as follows: 20% CoE, 80% BioE.

Using the Campus Budget Office's report on net tuition received, tuition as non-recurring funds will be distributed to BioE at the end of each fiscal year. This agreement is effective August 16th, 2017 (or when program is official approved by IBHE) and valid through August 15, 2020.

Signatures:



10-8-2015

by Bill Buttlar
Associate Dean of Graduate, Professional & Online Programs
College of Engineering

Date



10-8-2015

by Rashid Bashir
Head, Department of Bioengineering

Date

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

University Library

Office of Dean of Libraries
and University Librarian
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801



October 8, 2015

Bill Buttlar, Associate Dean, Graduate, Professional, and Online Programs,
College of Engineering
College of Engineering @ ILLINOIS
Engineering Hall 405
1308 West Green Street
Urbana, IL 61801

Dear Dean Buttlar:

Thank you for providing the University Library with the opportunity to review the College of Engineering's proposals to the Senate's Committee on Educational Policy. The two proposals that this letter references include the College's proposals to:

- Establish a major in Bioengineering in the Department of Bioengineering, College of Engineering for the degree of Master of Engineering.
- Establish two transcriptable concentrations, Bioinstrumentation and Computational Genomics, under the major in Bioengineering in the Department of Bioengineering, College of Engineering for the degree of Master of Engineering.

Based upon the proposal that we reviewed, the University Library's assessment is that we are generally well-positioned to support the program. However, maintaining the support necessary to ensure the success of this program depends at least in part on budgetary commitments laid out in planning for the College of Medicine, specifically additional collection funds for books, journals and online resources as well as funds to enhance staffing.

The University Library and the College of Engineering have a long history of working closely together. We look forward to utilizing the resources committed in order to grow in the areas necessary to provide support for this program.

Sincerely,



John P. Wilkin
Juanita J. and Robert E. Simpson Dean of Libraries and University Librarian

Cc: Rhonda McElroy
Bill Mischo
Mary Schlembach
Thomas Teper
Kelli Trei

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

College of Engineering
Graduate, Professional & Online Programs
401 Engineering Hall, MC-266
1308 West Green Street
Urbana, IL 61801



October 9, 2015

Rohit Bhargava, Vice Chair
Executive Committee
College of Engineering

Dear Professor Bhargava:

My office has reviewed the curriculum proposal to establish two transcriptable concentrations under the M.Eng. in Bioengineering degree program. We are submitting it for consideration to the Executive Committee:

Establish three transcriptable concentrations, General Bioengineering, Bioinstrumentation, and Computational Genomics, under the major in Bioengineering in the Department of Bioengineering, College of Engineering for the degree of Master of Engineering

Sincerely,

A handwritten signature in red ink, appearing to read 'W. G. Buttlar', written over a horizontal line.

William G. Buttlar
Associate Dean
Office of Graduate and Professional Programs



Senate Educational Policy Committee Proposal Check Sheet

PROPOSAL TITLE (Same as on proposal): Establish three transcriptable concentrations, General Bioengineering, Bioinstrumentation, and Computational Genomics, under the major in Bioengineering in the Department of Bioengineering, College of Engineering for the degree of Master of Engineering.

PROPOSAL TYPE (select all that apply below):

A. Proposal for a NEW or REVISED degree program. Please consult the Programs of Study Catalog for official titles of existing degree programs.

1. Degree program level:

Graduate Professional Undergraduate

2. Proposal for a new **degree** (e.g. B.S., M.A. or Ph.D.):

Degree name, “e.g., *Bachelor of Arts or Master of Science*”: _____

3. Proposal for a new or revised **major, concentration, or minor**:

New or Revised **Major** in (name of existing or proposed major): _____

New or Revised **Concentration** in (name of existing or proposed concentration):

General Bioengineering, Bioinstrumentation, and Computational Genomics

New or Revised **Minor** in (name of existing or proposed minor): _____

4. Proposal to rename an existing major, concentration, or minor:

Major Concentration Minor

Current name: _____

Proposed new name: _____

5. Proposal to terminate an existing degree, major, concentration, or minor:

Degree Major Concentration Minor

Name of existing degree, major, or concentration: _____

6. Proposal involving a multi-institutional degree:

New Revision Termination

Name of existing Illinois (UIUC) degree: _____

Name of non-Illinois partnering institution: _____

Location of non-Illinois partnering institution:

State of Illinois US State: _____ Foreign country: _____

- B. Proposal to create a new academic unit (college, school, department, program or other academic unit):

Name of proposed new unit: _____

- C. Proposal to rename an existing academic unit (college, school, department, or other academic unit):

Current name of unit: _____

Proposed new name of unit: _____

- D. Proposal to reorganize existing units (colleges, schools, departments, or program):

1. Proposal to change the status of an existing and approved unit (e.g. change from a program to department)

Name of current unit including status: _____

2. Proposal to transfer an existing unit:

Current unit's name and home: _____

Proposed new home for the unit: _____

3. Proposal to merge two or more existing units (e.g., merge department A with department B):

Name and college of unit one to be merged: _____

Name and college of unit two to be merged: _____

Proposed name and college of new (merged) unit: _____

4. Proposal to terminate an existing unit:

Current unit's name and status: _____

- E. **Other educational policy proposals** (e.g., academic calendar, grading policies, etc.)

Nature of the proposal: _____

Revised 10/2012