

Program Change Request

APPROVED BY SENATE

03/04/2024

EP.24.077_FINAL

Approved by EP 02/26/2024

Date Submitted: 09/26/23 11:07 am

Viewing: **10KS0408PHD** :

Bioengineering, PhD

Last approved: 09/06/22 10:01 am

Last edit: 02/23/24 7:56 am

Changes proposed by: Maddie Darling

[Bioengineering, PhD](#)

Catalog Pages

Using this

Program

Proposal Type:

In Workflow

1. U Program Review
2. 1343 Head
3. KP Committee Chair
4. KP Dean
5. University Librarian
6. Grad_College
7. COTE Programs
8. Provost
9. Senate EPC
10. Senate
11. U Senate Conf
12. Board of Trustees
13. IBHE
14. HLC
15. DOE
16. DMI

Approval Path

1. 09/27/23 8:32 pm
Donna Butler (dbutler):
Approved for U Program Review
2. 09/28/23 8:08 am
Mark Anastasio (maa): Approved for 1343 Head
3. 01/12/24 10:08 am
Keri Pipkins (kcp):
Approved for KP Committee Chair
4. 01/12/24 10:08 am
Michael Stoller (stoller4):
Approved for KP Dean
5. 01/22/24 10:22

am
Claire Stewart
(clairest):
Approved for
University
Librarian

6. 02/07/24 3:24 pm
Allison McKinney

(agrindly):
Approved for
Grad_College

7. 02/07/24 3:37 pm
Suzanne Lee

(suzannel):
Approved for
COTE Programs

8. 02/08/24 3:23 pm
Brooke Newell

(bsnewell):
Approved for
Provost

History

1. Jan 21, 2020 by
Mary Lowry
(lowry)

2. Mar 14, 2022 by
Mary Lowry
(lowry)

3. Sep 6, 2022 by
Mary Lowry
(lowry)

Major (ex. Special Education)

This proposal is
for a:
Revision

Administration Details

Official Program Name	Bioengineering, PhD
Diploma Title	
Sponsor College	Grainger College of Engineering
Sponsor	Bioengineering

Department

Sponsor Name [Maddie Darling, Wawrzyniec Dobrucki](#)

Sponsor Email darling4@illinois.edu, dobrucki@illinois.edu

College Contact [Keri Carter Pipkins](#)

College Contact
Email

kcp@illinois.edu

College Budget
Officer

College Budget
Officer Email

List the role for rollbacks (which role will edit the proposal on questions from EPC, e.g., Dept Head or Initiator) and/or any additional stakeholders. Purpose: List here who will do the editing work if proposal needs rolled back. And any other stakeholders.

[Maddie Darling \(darling4@illinois.edu\), BIOE; Keri Carter Pipkins \(kcp@Illinois.edu\), Grainger Administration](#)

Does this program have inter-departmental administration?

No

Proposal Title

Effective Catalog Term Fall 2024

Proposal Title (either Establish/Revise/Eliminate the Degree Name in Program Name in the College of XXXX, i.e., Establish the Bachelor of Science in Entomology in the College of Liberals Art and Sciences, include the Graduate College for Grad Programs)

Revise the Doctor of Philosophy in Bioengineering in the Grainger College of Engineering and the Graduate College

Does this proposal have any related proposals that will also be revised during the next 6 weeks? Consider Majors, Minors, Concentrations & Joint Programs in your department. Please know that this information is used administratively to move related proposals through workflow efficiently. Example: If you are revising the BS proposal and one related concentration within the next 6 weeks, "This BS proposal (key 567) is related to the Concentration A proposal (key 145)."

This PhD-Bioengineering proposal (key 41) is related to the MS-Bioengineering proposal (key 45).

Program Justification

Provide a brief description of what changes are being made to the

Bioengineering, PhD (Proposed Revisions) - Entering with an approved M.S. degree

1. Require BIOE 500 and BIOE 502 as courses in the curriculum, requiring 2 semesters of BIOE 500.
2. Reduce technical elective hours selected in consultation with their advisor from 12

program.

hours to 8 hours.

Bioengineering, PhD (Proposed Revisions) - Entering with an approved B.S. degree

1. Require BIOE 500 and BIOE 502 as courses in the curriculum, requiring 4 semesters of BIOE 500.
2. Increase thesis research hour requirements from 55 hours to 66 hours.
3. Reduce technical elective hours selected in consultation with their advisor from 12 hours to 8 hours.
4. Rename the prior 21-hours of BIOE 500 level courses category to fundamental electives, requiring 12 hours of coursework to be completed across three subdiscipline categories. Reallocate 9 hours from the previous 21-hours of BIOE 500-level categories to other areas of the degree.
5. Require 12 hours of coursework be obtained through BIOE-rubric courses within the fundamental elective or technical elective categories.

Correct an error in the minimum total credit hour srequired for the program in Program Features.

Total hours in the program remain unchanged.

Did the program content change 25% or more in relation to the total credit hours, since the 2020-2021 catalog. (<http://catalog.illinois.edu/archivedacademiccatalogs/2020-2021/>)

No

Why are these changes necessary?

Bioengineering, PhD (Proposed Revisions) - Entering with an approved M.S. degree

1. Previously, BIOE 500 and BIOE 502 were optional courses within the PhD program and internally advertised under the 12 hours of elective coursework. BIOE 500 and BIOE 502 are now mandatory as part of the professional development curriculum. These courses have been made compulsory to ensure that students acquire a comprehensive understanding of diverse disciplines within the field of bioengineering. Enrolling in BIOE 500, which spans two semesters for PhD candidates entering with an MS degree, will provide students with a valuable opportunity to expand their knowledge in bioengineering. Additionally, BIOE 502 will expose them to cutting-edge topics in bioengineering, fostering connections with external faculty and professionals in the field. Furthermore, BIOE 502 will enhance students' skills in grant writing and technical writing, making it an essential component of the curriculum.

2. To establish a 4-hour professional development component for students, we decided to reallocate four hours of technical elective coursework. BIOE 500 and BIOE 502 were formerly available as technical electives, but we have now made them compulsory within the professional development section of the degree program. We believe the reduction in technical elective hours from 12 to 8, and resulting requirement of BIOE 500 and BIOE 502 courses will be advantageous for students, for the reasons described in the previous statement (#1). We reduced technical elective hours in order to require two courses that were previously in the technical elective course list (BIOE 500 and BIOE 502, 4 total hours combined) as courses now required for the degree in the professional development category.

Bioengineering, PhD (Proposed Revisions) - Entering with an approved B.S. degree

1. Previously, BIOE 500 and BIOE 502 were optional courses within the PhD program and internally advertised under the 12 hours of elective coursework. BIOE 500 and BIOE 502 are now mandatory as part of the professional development curriculum. These courses have been made compulsory to ensure that students acquire a comprehensive understanding of diverse disciplines within the field of bioengineering. Enrolling in BIOE 500, which spans four semesters for PhD candidates entering with an BS degree, will provide students with a valuable opportunity to expand their knowledge in bioengineering. Completing BIOE 500 each semester through the conclusion of year 2 also course presents an opportunity to foster a sense of community and establish a cohesive cohort, which students had expressed they previously felt could be improved. Additionally, BIOE 502 will expose them to cutting-edge topics in bioengineering, fostering connections with external faculty and professionals in the field. Furthermore, BIOE 502 will enhance students' skills in grant writing and technical writing, making it an essential component of the curriculum.

2. The increase in research credits was implemented with the aim of decreasing lecture hours and enhancing the emphasis on research and research-related opportunities, which aligns with the core purpose of our PhD program. Historically, our students upon graduate complete more than 55 hours of thesis research. We believe that this modification will be advantageous to students, as it will provide them with more extensive prospects to generate publishable research data and enhance their credentials as PhD researchers.

3. We decided to reallocate 8 hours from technical coursework to enhance the allocation of hours for professional development and thesis research. Specifically, 4 hours previously designated for technical elective courses have been removed to require BIOE 500 and 502 in another category. This reduction in technical coursework is advantageous to students as it provides them with more time and hours to delve deeper into their specialized research disciplines while providing hours back to the curriculum to create a professional development coursework focus area.

4. Several of the prior choices from the initial 21-hour BIOE 500-level credit requirement are retained as options in the newly established fundamental elective category grouping. These options include, among others, BIOE 504, 505, and former 598s now being submitted for permanence. We have structured these subcategories as they represent fundamental subdomains within the realm of bioengineering. By mandating students to select one course from each category, we aim to ensure that their knowledge of the bioengineering field is comprehensive rather than narrowly focused on a specific subdiscipline. This comprehensive training will benefit students as they embark on careers as practitioners, researchers, and industry professionals. Moreover, this revision and the introduction of fundamental elective categories acknowledge the diverse academic backgrounds of students entering our program, facilitating a path for them to attain a well-rounded comprehension of bioengineering concepts.

5. Our rationale behind requiring 12 hours of BIOE rubric coursework is to ensure that graduates of our program acquire a robust grasp of vital bioengineering principles and concepts. Therefore, we insist that students fulfill a minimum of 12 hours of coursework specifically designated as BIOE. This stipulation covers a wide spectrum, encompassing both fundamental and technical aspects of bioengineering education.

The previous Program Features indicated 96 hours of credit were required to earn a PhD, this is incorrect. The minimum hours to earn a PhD for those entering with an approved MS degree are 64 total hours. We have corrected this information to clearly present our degree requirements to all parties. Total hours required in the program remain unchanged.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

Yes

Please describe:

[BIOE 501: Seminar Discussion and BIOE 507: Advanced Bioinstrumentation will no longer be offered. These courses will be submitted for deactivation. Other fundamental elective options have been made available in their place. BIOE 507 has historically very low enrollment, not meeting the campus six-ten policy for offering courses.](#)

Does this new program/proposed change result in the replacement of another program?

No

Does the program include other courses/subjects outside of the sponsoring department impacted by the creation/revision of this program?

Yes

Courses outside
of the sponsoring
department/interdisciplinary
departments

- [IB 501 - Programming for Genomics](#)
- [STAT 510 - Mathematical Statistics](#)
- [STAT 511 - Adv Math Stat](#)
- [STAT 525 - Computational Statistics](#)
- [STAT 527 - Advanced Regression Analysis](#)
- [STAT 528 - Adv Regression Analysis II](#)
- [STAT 530 - Bioinformatics](#)
- [STAT 533 - Advanced Stochastic Processes](#)
- [STAT 534 - Advanced Survival Analysis](#)
- [STAT 541 - Predictive Analytics](#)
- [STAT 542 - Statistical Learning](#)
- [STAT 543 - Appl. Multivariate Statistics](#)
- [STAT 545 - Spatial Statistics](#)
- [STAT 546 - Machine Learning in Data Sci](#)
- [STAT 551 - Theory of Probability I](#)
- [STAT 552 - Theory of Probability II](#)
- [STAT 553 - Probability and Measure I](#)
- [STAT 554 - Probability and Measure II](#)
- [STAT 555 - Applied Stochastic Processes](#)
- [STAT 556 - Advanced Time Series Analysis](#)
- [STAT 558 - Risk Modeling and Analysis](#)
- [STAT 571 - Multivariate Analysis](#)
- [STAT 575 - Large Sample Theory](#)
- [STAT 576 - Empirical Process Theory](#)
- [STAT 578 - Topics in Statistics](#)
- [STAT 587 - Hierarchical Linear Models](#)
- [STAT 588 - Covar Struct and Factor Models](#)

Please attach any [LOS_IB.pdf](#)
letters of [LOS_STAT.pdf](#)
support/acknowledgement
for any
Instructional
Resources
consider faculty,
students, and/or
other impacted
units as
appropriate.

Program Regulation and Assessment

Plan to Assess and Improve Student Learning

Illinois Administrative Code: 1050.30(b)(1)(D) Provision is made for guidance and counseling of students, evaluations of student performance, continuous monitoring of progress of students toward their degree objectives and appropriate academic record keeping.

List the program's student learning outcomes. Each outcome should identify what students are expected to know and/or be able to do upon completing this program.

Ability to apply quantitative skills and engineering principles to propose novel and practical solutions to medical/human health problems

Understanding of professional and ethical responsibilities

Ability to communicate scientific problems and solutions, as well as their impact, effectively to a diverse audience and stakeholders, both orally and in writing

Demonstrate moderate technical mastery in chosen research area, shown by the ability to identify an important scientific problem, formulate a hypothesis, and design experiments to conduct research and data analysis to test the hypothesis. The student should also be able to formulate alternatives.

Develop effective leadership skills in order to foster the ability to conduct collaborative research and work with a diverse team

Describe how, when, and where these learning outcomes will be assessed.

Describe here:

Identify faculty expectations for students' achievement of each of the stated student learning outcomes. What score, rating, or level of expertise will signify that students have met each outcome? Provide rating rubrics as necessary.

Explain the process that will be implemented to ensure that assessment results are used to improve student learning.

Program

Description and

Requirements

Attach Documents

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PublicAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide

information on how the upper-division hours requirement will be satisfied.

Revised programs [BIOE PhD Side by Side.xlsx](#)

Attach a revised Sample Sequence (for undergraduate program) or college-level forms.

Catalog Page Text - Overview Tab

Description of program for the catalog page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

Statement for Programs of Study Catalog

Entering with approved M.S. degree degree

Course List

Code	Title	Hours
BIOE 599	Thesis Research (min-max applied toward degree)	55
500 level BioE courses: See approved list		21
Elective courses: At least 12 hours must be engineering graduate-level courses. See website for more details.		20
Total hours		96

Course List

Code	Title	Hours
	<u>Professional Development</u>	<u>4</u>
<u>BIOE 500</u>	<u>Graduate Seminar (two semesters)</u>	<u>2</u>
<u>BIOE 502</u>	<u>Bioengineering Professionalism</u>	<u>2</u>
	<u>Thesis Research</u>	<u>52</u>
BIOE 599	Thesis Research (min-max applied toward degree)	52
	Elective courses	12
	<u>Technical Elective Courses</u>	<u>8</u>
	<u>Selected in consultation with advisor</u>	<u>8</u>
	<u>Total Hours</u>	<u>64</u>
	<u>Other Requirements and Conditions</u>	
	Other Requirements and Conditions	

Grad Other Degree Requirements

Requirement	Description
Other Requirements and Conditions may overlap	
Minimum program GPA:	3.0
A Masters degree is required for admission to the Ph.D. program.	
Qualifying exam	
Preliminary exam	
Final exam and dissertation defense	
Dissertation deposit	
Entering with B.S. <u>degree</u>	

Course List

Code	Title	Hours
	<u>Professional Development</u>	<u>6</u>
<u>BIOE 500</u>	<u>Graduate Seminar (four semesters)</u>	<u>4</u>

Code	Title	Hours
<u>BIOE 502</u>	<u>Bioengineering Professionalism</u>	<u>2</u>
	<u>Thesis Research</u>	<u>66</u>
<u>BIOE 599</u>	<u>Thesis Research (min-max applied toward degree)</u>	<u>66</u>
	<u>Technical Elective Courses</u>	<u>12</u>
	<u>Selected in consultation with advisor</u>	<u>12</u>
	<u>Fundamental Courses</u>	<u>12</u>
	<u>Students must select one course from each of the three categories below</u>	<u>12</u>
	<u>Statistics and Data Science</u>	
<u>BIOE 484</u>	<u>Statistical Analysis of Biomedical Images</u>	<u>4</u>
<u>BIOE 505</u>	<u>Computational Bioengineering</u>	<u>4</u>
<u>IB 501</u>	<u>Programming for Genomics</u>	<u>4</u>
<u>STAT 510</u>	<u>Mathematical Statistics</u>	<u>4</u>
<u>STAT 511</u>	<u>Advanced Mathematical Statistics</u>	<u>4</u>
<u>STAT 525</u>	<u>Topics in Computational Statistics</u>	<u>4</u>
<u>STAT 527</u>	<u>Advanced Regression Analysis</u>	<u>4</u>
<u>STAT 528</u>	<u>Advanced Regression Analysis II</u>	<u>4</u>
<u>STAT 530</u>	<u>Bioinformatics</u>	<u>4</u>
<u>STAT 533</u>	<u>Advanced Stochastic Processes</u>	<u>4</u>
<u>STAT 534</u>	<u>Advanced Survival Analysis</u>	<u>4</u>
<u>STAT 541</u>	<u>Advanced Predictive Analytics</u>	<u>4</u>
<u>STAT 542</u>	<u>Statistical Learning</u>	<u>4</u>
<u>STAT 543</u>	<u>Appl. Multivariate Statistics</u>	<u>4</u>
<u>STAT 545</u>	<u>Spatial Statistics</u>	<u>4</u>
<u>STAT 546</u>	<u>Machine Learning in Data Science</u>	<u>4</u>
<u>STAT 551</u>	<u>Theory of Probability I</u>	<u>4</u>
<u>STAT 552</u>	<u>Theory of Probability II</u>	<u>4</u>
<u>STAT 553</u>	<u>Probability and Measure I</u>	<u>4</u>
<u>STAT 554</u>	<u>Probability and Measure II</u>	<u>4</u>
<u>STAT 555</u>	<u>Applied Stochastic Processes</u>	<u>4</u>
<u>STAT 556</u>	<u>Advanced Time Series Analysis</u>	<u>4</u>
<u>STAT 558</u>	<u>Risk Modeling and Analysis</u>	<u>4</u>
<u>STAT 571</u>	<u>Multivariate Analysis</u>	<u>4</u>
<u>STAT 575</u>	<u>Large Sample Theory</u>	<u>4</u>
<u>STAT 576</u>	<u>Empirical Process Theory and Weak Convergence</u>	<u>4</u>
<u>STAT 578</u>	<u>Topics in Statistics</u>	<u>4</u>
<u>STAT 587</u>	<u>Hierarchical Linear Models</u>	<u>4</u>
<u>STAT 588</u>	<u>Covar Struct and Factor Models</u>	<u>4</u>
	<u>Engineering Math</u>	
<u>BIOE 432</u>	<u>Systems Biology: Uncovering Design Principles of Biological Networks</u>	<u>3 or 4</u>
<u>BIOE 450</u>	<u>Introduction to Quantitative Pharmacology</u>	<u>3 or 4</u>
<u>BIOE 485</u>	<u>Computational Mathematics for Machine Learning and Imaging</u>	<u>4</u>
<u>BIOE 504</u>	<u>Analytical Methods in Bioeng</u>	<u>4</u>
	<u>Life Sciences</u>	
<u>BIOE 430</u>	<u>Intro Synthetic Biology</u>	<u>4</u>
<u>BIOE 434</u>	<u>Immunoengineering</u>	<u>3 or 4</u>
<u>BIOE 487</u>	<u>Stem Cell Bioengineering</u>	<u>4</u>
<u>BIOE 526</u>	<u>Advances in Biotechnology</u>	<u>4</u>

Code	Title	Hours
<u>Total Hours</u>		<u>96</u>
<u>Other Requirements and Conditions</u>		
Grad Other Degree Requirements		
Requirement		Description
Other Requirements and Conditions may overlap		
<u>12 total hours from the Fundamental Courses and/or Technical Elective Courses categories must be BIOE-rubric courses.</u>		
Minimum program GPA:		3.0
Qualifying exam		
Preliminary exam		
Final exam and dissertation defense		
Dissertation deposit		
degree		
Course List		
Code	Title	Hours
BIOE-599	Thesis Research (min-max applied toward degree)	55
500-level BioE courses: See approved list		21
Elective courses: At least 12 hours must be engineering graduate level courses. See website for more details.		20
Total hours		96
Other Requirements and Conditions		

Corresponding Degree PhD Doctor of Philosophy

Program Features

Academic Level Graduate

Does this major have transcripted concentrations? Yes ~~No~~

Will you admit to the concentration directly? No

Is a concentration required for graduation? No

What is the typical time to completion of this program? 5 years

What are the minimum Total Credit Hours required for this program? 64 ~~96~~

What is the required GPA? 3.0

CIP Code 140501 - Bioengineering and Biomedical Engineering.

Is This a Teacher Certification Program?
No

Will specialized accreditation be sought for this program?
No

Delivery Method

This program is available:

On Campus - Students are required to be on campus, they may take some online courses.

Admission Requirements

Desired Effective Admissions Term

Is this revision a change to the admission status of the program?

No

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

Describe how this revision or phase down/elimination will impact enrollment and degrees awarded. If this is an elimination/phase down proposal include the plans for the students left in the program.

This revision will not impact enrollment or degrees awarded.

Estimated Annual Number of Degrees Awarded

Year One Estimate

5th Year Estimate (or when fully implemented)

What is the matriculation term for this program?
Fall

Budget

Are there budgetary implications for this revision?
No

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?

No

Additional Budget Information

Attach File(s)

Financial Resources

How does the unit intend to financially support this proposal?

Will the unit need to seek campus or other external resources?

No

Attach letters of support

What tuition rate do you expect to charge for this program? e.g, Undergraduate Base Tuition, or Engineering Differential, or Social Work Online (no dollar amounts necessary)

Are you seeking a change in the tuition rate or differential for this program?

No

Is this program requesting self-supporting status?

No

Faculty Resources

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

This revision does not change faculty numbers, class size, teaching loads, or student-faculty ratios.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

Library collections, resources and services are sufficient to support this revision.

EP Documentation

EP Control Number

EP.24.077

Attach
Rollback/Approval
Notices
This proposal
requires HLC
inquiry

No

DMI Documentation

Attach Final
Approval Notices

Banner/Codebook Name PHD: Bioengineering-UIUC

Program Code: 10KS0408PHD

Minor Code	Conc Code	Degree Code	PHD	Major Code
0408				

Senate Approval
Date

Senate
Conference
Approval Date

BOT Approval
Date

IBHE Approval
Date

HLC Approval
Date

DOE Approval
Date

Effective Date:

Attached
Document
Justification for
this request

Program Reviewer Comments **Brooke Newell (bsnewell) (09/15/23 2:37 pm):** Rollback: Email sent to Maddie and Keri.

Mary Lowry (lowry) (09/21/23 5:15 pm): Rollback: Please see email dated 9-21-23

Mary Lowry (lowry) (09/26/23 10:59 am): Rollback: One more comment. See 9-26-23 email

Darling, Maddie

[REDACTED]

[REDACTED]

From: Allan, Brian F <ballan@illinois.edu>

Sent: Friday, August 25, 2023 4:13 PM

To: Anastasio, Mark -- BIOE Department Head <bioe-head@illinois.edu>

Cc: bioen <bioen@mx.uillinois.edu>; O'Dwyer, Allison <aodwyer@illinois.edu>; Catchen, Julian <jcatchen@illinois.edu>

Subject: Re: Letter of Support to Request to Add a Course

Dear Professor Anastasio,

Yes I am happy to approve. The School of Integrative Biology is supportive of the proposal to add IB 501 to the Master of Science and Doctor of Philosophy Programs in Bioengineering. We can provide access to your estimated 5 students per term, subject to capacity and course availability.

Best,
Brian

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Brian F. Allan
Professor, Department of Entomology
Associate Director for Academic Affairs, School of Integrative Biology
University of Illinois Urbana-Champaign
<https://publish.illinois.edu/ballan/>

From: Anastasio, Mark -- BIOE Department Head <bioe-head@illinois.edu>

Sent: Friday, August 25, 2023 2:49 PM

To: Allan, Brian F <ballan@illinois.edu>

Cc: bioen <bioen@mx.uillinois.edu>

Subject: Letter of Support to Request to Add a Course

Dear Professor Allan,

I am writing on behalf of the Department of Bioengineering to request a letter of support to add IB 501: Programming for Genomics as an elective course in the proposed revisions to the Master of Science and Doctor of Philosophy Programs in Bioengineering. This course, if approved, would be added as an elective option in our Statistics and Data Science category of electives. This program is expected to enroll 30 per year, and we would expect 5 students to enroll in the course controlled by your unit listed above.

If approved, an email response including the following information is sufficient.

The Department of [XXX] is supportive of the proposal to add IB 501 to the Master of Science and Doctor of Philosophy Programs in Bioengineering. We can provide access to your estimated 5 students per term, subject to capacity and course availability.

Thank you,

Mark Anastasio

MARK ANASTASIO

Donald Biggar Willett Professor in Engineering

Head, Department of Bioengineering

Affiliate Professor, Department of Computer Science

Affiliate Professor, Department of Electrical and Computer Engineering

Affiliate Professor, Carle Illinois College of Medicine

Member, Beckman Institute for Advanced Science and Technology

Department of Bioengineering | The Grainger College of Engineering
1406 W. Green Street | 1102G Everitt Lab, MC 278 | Urbana, IL 61801

(P) 217.300.0314 | maa@illinois.edu

<https://bioengineering.illinois.edu/>

Lab Website: <https://anastasio.bioengineering.illinois.edu>

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Statistics
101 Illini Hall
725 South Wright Street
Champaign, IL 61820



August 25, 2023

Professor Mark Anastasio
Head, Department of Bioengineering

Dear Mark,

The Department of Statistics is supportive of the proposal to add all 500-level Statistics courses as elective course options in the proposed revisions to the Master of Science and Doctor of Philosophy Programs in Bioengineering. We can provide access to your estimated 5 students per term, subject to capacity and course availability.

Sincerely,

A handwritten signature in black ink that reads "Bo Li".

Bo Li
Chair, Department of Statistics

Key below:
 Red Text = Edits or removals made
 Green Text = Proposed new courses/hours

Bioengineering, PhD (Current Program of Study) - Entering with an approved M.S. degree		
Code	Title	Hours
BIOE 599	Thesis Research (min-max applied toward degree)	52
	Elective Courses	12
Total Hours		64
Other Requirements and Conditions		
	Other Requirements and Conditions may overlap	
	Minimum program GPA:	3.0
	Qualifying exam	
	Preliminary exam	
	Final exam and dissertation defense	
	Dissertation deposit	

Bioengineering, PhD (Proposed Revisions) - Entering with an approved M.S. degree			Summary of Changes
Code	Title	Hours	
	Professional Development	4	+4 hours
BIOE 500	Graduate Seminar (two semesters)	2	
BIOE 502	Bioengineering Professionalism	2	
	Thesis Research	52	No change
BIOE 599	Thesis Research (min-max applied toward degree)	52	
	Technical Elective Courses (selected in consultation with advisor)	8	-4 hours
	Technical Elective Courses (selected in consultation with advisor)	8	
Total Hours		64	No Change
Other Requirements and Conditions			
	Other Requirements and Conditions may overlap		
	Minimum program GPA:	3	
	Qualifying exam		
	Preliminary exam		
	Final exam and dissertation defense		
	Dissertation deposit		

Bioengineering, PhD (Current Program of Study) - Entering with an approved B.S. degree		
Code	Title	Hours
BIOE 599	Thesis Research (min-max applied toward degree)	55
	Elective courses: At least 12 hours must be engineering graduate-level courses. See website for more details.	20
500-level BioE Courses	See Approved List	21
Total Hours		96
Other Requirements and Conditions		
	Other Requirements and Conditions may overlap	
	Minimum program GPA:	3
	Qualifying exam	
	Preliminary exam	
	Final exam and dissertation defense	
	Dissertation deposit	

Bioengineering, PhD (Proposed Revisions) - Entering with an approved B.S. degree			
Code	Title	Hours	
	Professional Development	6	+6 hours
BIOE 500	Graduate Seminar (four semesters)	4	
BIOE 502	Bioengineering Professionalism	2	
	Thesis Research	66	+11 hours
BIOE 599	Thesis Research (min-max applied toward degree)	66	
	Technical Elective Courses (selected in consultation with advisor)	12	-8 hours
	Technical Elective Courses (selected in consultation with advisor)	12	
	Fundamental Courses (select one from each category)	12	-9 hours (Category Heading renamed, see excel tab labeled "fundamental courses (list)")
	Statistics and Data Science	4	
	Engineering Math	4	
	Life Sciences	4	
Total Hours		96	No Change
Other Requirements and Conditions			
	Other Requirements and Conditions may overlap		
	12 total hours from the Fundamental Courses and/or Technical Elective Courses categories must be BIOE-rubric courses.	12	
	Minimum program GPA:	3	
	Qualifying exam		
	Preliminary exam		
	Final exam and dissertation defense		
	Dissertation deposit		

FUNDAMENTAL COURSES		
STATISTICS AND DATA SCIENCE	ENGINEERING MATH	LIFE SCIENCES
BIOE 484: Statistical Analysis Biomed Images	BIOE 432: Systems Biology	BIOE 430: Intro Synthetic Biology
BIOE 505: Computational Bioengineering	BIOE 450: Intro to Quantitative Pharma	BIOE 434: Immunoengineering
IB 501: Programming for Genomics	BIOE 485: Comp Math for ML and Imaging	BIOE 487: Stem Cell Bioengineering
STAT 510 : Mathematical Statistics	BIOE 504: Analytical Methods in Bioengineering	BIOE 526: Advances in Biotechnology
STAT 511: Adv Math Stat		
STAT 525: Computational Statistics		
STAT 527: Advanced Regression Analysis		
STAT 528: Adv Regression Analysis II		
STAT 530: Bioinformatics		
STAT 533: Advanced Stochastic Processes		
STAT 534: Advanced Survival Analysis		
STAT 541: Predictive Analytics		
STAT 542: Statistical Learning		
STAT 543: Appl. Multivariate Statistics		
STAT 545: Spatial Statistics		
STAT 546: Machine Learning in Data Sci		
STAT 551: Theory of Probability I		
STAT 552: Theory of Probability II		
STAT 553: Probability and Measure I		
STAT 554: Probability and Measure II		
STAT 555: Applied Stochastic Processes		
STAT 556: Advanced Time Series Analysis		
STAT 558: Risk Modeling and Analysis		
STAT 571: Multivariate Analysis		
STAT 575: Large Sample Theory		
STAT 576: Empirical Process Theory		
STAT 578: Topics in Statistics		
STAT 587: Hierarchical Linear Models		
STAT 588: Covar Struct and Factor Models		