

10KS5163PHD: AGRICULTURAL & BIOLOGICAL ENGINEERING, PHD

In Workflow

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14. U Senate Conf (none)
15. Board of Trustees (none)
16. IBHE (none)
17. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

Approval Path

1. Wed, 13 May 2020 17:59:20 GMT
Deb Forgacs (dforgacs): Approved for U Program Review
2. Wed, 13 May 2020 18:01:09 GMT
Keri Pipkins (kcp): Approved for 1227 Head
3. Wed, 13 May 2020 20:01:14 GMT
Kent Rausch (krausch): Approved for 1741 Committee Chair
4. Wed, 13 May 2020 20:53:25 GMT
Ronaldo Maghirang (ronaldom): Approved for 1741 Head
5. Fri, 07 Aug 2020 16:08:45 GMT
Anthony Yannarell (acyann): Approved for KL Committee Chair
6. Tue, 11 Aug 2020 19:37:07 GMT
Anna Ball (aball): Approved for KL Dean
7. Tue, 27 Oct 2020 17:45:54 GMT
Keri Pipkins (kcp): Approved for KP Committee Chair
8. Tue, 27 Oct 2020 17:51:46 GMT
Candy Deaville (candyd): Approved for KP Dean
9. Tue, 27 Oct 2020 19:16:59 GMT
John Wilkin (jpwilkin): Approved for University Librarian
10. Wed, 04 Nov 2020 18:38:23 GMT
Allison McKinney (agrindly): Approved for Grad_College
11. Wed, 04 Nov 2020 22:28:09 GMT
Kathy Martensen (kmartens): Approved for Provost

History

1. Feb 18, 2019 by Deb Forgacs (dforgacs)
2. Mar 14, 2019 by Deb Forgacs (dforgacs)
3. Mar 22, 2019 by Deb Forgacs (dforgacs)

Date Submitted: Wed, 13 May 2020 17:03:55 GMT

Viewing:10KS5163PHD : Agricultural & Biological Engineering, PhD

Changes proposed by: Keri Pipkins

Proposal Type

Proposal Type:

Major (ex. Special Education)

This proposal is for a:

Revision

Proposal Title:

If this proposal is one piece of a multi-element change please include the other impacted programs here. *example: A BS revision with multiple concentration revisions*

Revision of Curriculum Requirements for the Ph.D. in Agricultural & Biological Engineering to add a 96-Credit Hour Option, Department of Agricultural & Biological Engineering (ABE), The Grainger College of Engineering

EP Control Number

EP:21.026

Official Program Name

Agricultural & Biological Engineering, PhD

Effective Catalog Term

Fall 2021

Sponsor College

Grainger College of Engineering

Sponsor Department

Engineering Administration

Sponsor Name

Ronaldo G Maghirang, Department Head

Sponsor Email

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College Contact

Harry Dankowicz, Associate Dean for Graduate, Professional and Online Programs, The Grainger College of Engineering

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Program Description and Justification**Justification for proposal change:**

ABE would like to add a 96-credit hour option to the current PhD curriculum in Agricultural & Biological Engineering to allow students to be directly admitted into the PhD program. Currently, graduate students are required to hold an approved Master's degree before they can enter the PhD program. Students without an approved Master's degree must first complete the non-thesis or thesis-based Master's in ABE before entering the PhD program, which is a 64- credit hour curriculum.

Under the 96-credit hour curriculum, termed the Direct Ph.D., students will complete the following requirements, which are outlined in detail in the attached Appendix A.

- 56-credit hours of graduate level coursework with specific requirements in math, stats, and instrumentation.
- At least 6 credit hours 500-level coursework (taken for at least 3 credit hours formal courses)
- 40-credit hours of thesis research
- Successful completion of the Preliminary and Final Defense exams.

These requirements (coursework and thesis) are equivalent to the addition of the requirements of the thesis-based ABE Master's degree plus the 64-credit hour ABE PhD curriculum. In essence, the Direct Ph.D. student will fulfill exactly the same requirements as the student undertaking first an MS and then a PhD, but without preparing an MS thesis (or receiving an MS degree). It will be optional under the Direct PhD curriculum for students to obtain a non-thesis or thesis-based MS degree along the way to the PhD.

Under the current curriculum, students without an approved MS degree must first be admitted into the non-thesis or thesis-based MS degree program in ABE and then petition into the PhD degree program. This is hindering ABE from recruiting top talent into its graduate program. Many students applying to the ABE PhD degree program want to be directly admitted into the PhD program without the requirement of first completing an MS degree. Many of our peer ABE doctoral programs have an option to directly admit students to the PhD program without requiring a prior MS degree, including almost all the departments in the Grainger College of Engineering at the University of Illinois. Examples of direct admit PhD in ABE: Cornell University, Purdue University, Texas A&M University, and Iowa State University. This difference places Illinois at a distinct competitive disadvantage when recruiting top applicants who intend to pursue a PhD degree. Implementing the Direct PhD option keeps us competitive with our peers.

Corresponding Degree

PhD Doctor of Philosophy

Is this program interdisciplinary?

Yes

Interdisciplinary Colleges and Departments (list other colleges/departments which are involved other than the sponsor chose above)

The Agricultural & Biological Engineering department is interdisciplinary.

College

Agr, Consumer, & Env Sciences

Department

Agricultural & Biological Engr

Do you need to add an additional interdisciplinary relationship?

No

Academic Level

Graduate

Will you admit to the concentration directly?

No

Is a concentration required for graduation?

No

CIP Code

140301 - Agricultural Engineering.

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Admission Requirements

Desired Effective Admissions Term

Fall 2021

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.

Admission to the ABE Direct PhD program will require applicants to have a bachelor's degree in ABE or an equivalent bachelor's degree from an accredited institution whose requirements for the bachelor's degree are substantially equivalent to those of the University of Illinois. Applicants must hold at least a 3.75 or higher GPA to be considered for admission. Under exceptional circumstances, the Graduate Committee can approve a petition to admit outstanding applicants with a GPA lower than 3.75, (but higher than 3.50) to the ABE Direct PhD program. In addition, the Graduate Record Examination (GRE) is required.

All applicants whose native language is not English must submit a minimum TOEFL score of 88 (iBT), or minimum International English Language Testing System (IELTS) academic exam scores of 6.5 overall and 6.0 in all subsections. Applicants may be exempt from the TOEFL if certain criteria are met. For those taking the TOEFL or IELTS, full admission status is granted for scores greater than 102 (TOEFL iBT), or 7.0 (IELTS). 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.

Describe how critical academic functions such as admissions and student advising are managed.

There are no capacity implications with respect to the proposed change. With the direct PhD option in ABE, there will be fewer admission offers made to applicants for the non-thesis and thesis-based master's degree. The department's goal is not to increase the total number of non-thesis or thesis-based master's and PhD students that are currently admitted. There will be no additional enrollment beyond the numbers currently supported by the department. Graduate student enrollment is limited by the number of research assistantships (faculty grants) and by available teaching assistantships.

Enrollment

Describe how this revision will impact enrollment and degrees awarded.

The enrollment in the ABE master's degree may decrease some. ABE will admit students that wish to earn their PhD into the Direct PhD curriculum vs. the master's degree. In addition, this change may affect the number of master's degree awarded. Students in the Direct PhD curriculum will have the option to earn a master's degree along the way, but not all will choose to do so.

Estimated Annual Number of Degrees Awarded

Year One Estimate

admin

5th Year Estimate (or when fully implemented)

admin

What is the matriculation term for this program?

Fall

Delivery Method

Is this program available on campus and online?

No

This program is available:

On Campus

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

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/ acknowledgement from faculty, students, and/or other impacted units as appropriate.

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

There are no negative implications on faculty resources for either of the proposed changes.

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.

This proposed change will not impact the University Library.

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?

No

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

No

Financial Resources

How does the unit intend to financially support this proposal?

There will not be any budgetary obligations due to these changes to the ABE PhD curriculum. The program implementations will be carried out with existing resources.

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

No

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

Yes

Is this program requesting self-supporting status?

No

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

Student learning objectives of the program are based on student outcomes suggested by ABET, Inc.:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
7. an ability to plan and conduct independent research with expertise in research design, methods, and analysis.

These learning objectives/outcomes will be assessed by the advisor and the PhD thesis research committee. In the ABE department, each graduate student is required to submit an annual review report by meeting with their advisors to assess their progress to their degrees, including courses, research, publications, and teaching experience. The ABE department provides detailed written feedback to students on strengths and weaknesses in either electronic or paper format based on the evaluations by their advisors. In addition, students have an opportunity to discuss their review

in person with their advisor and/or administrators in the department. In the event that a student does not receive a satisfactory review, the ABE department will develop, in consultation with the student and advisor, an academic plan to monitor progress over the next six months toward timely degree completion. This plan will also address possible outcomes if progress is not made within the outlined timeframe. The Director of Graduate Studies also serves as a gate-keeper to verify the requirement for the students, including course work, credit hours, and other requirements (such as ESL classes for international students). The ability to conduct independent research is assessed through the Preliminary Examination and Final Examination.

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/PrivateAdminRules2017.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.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs

Side by Side ABE DirectPhDAppendixA.docx

Attach a side-by-side comparison with the existing program AND, if the revision references or adds “chose-from” lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text

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

The degree of Doctor of Philosophy, primarily a research degree, requires from three to four years of graduate study beyond the master’s degree or with direct admit PhD requires from five and six year past the bachelor’s degree. The major area of specialization encompasses courses and research that are closely related, but the courses need not be offered by a single major department. Candidates must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

Statement for Programs of Study Catalog

Code	Title	Hours
ABE 501	Graduate Research I	1
ABE 594	Graduate Seminar (minimum 6 semesters)	0
	At least one MATH course beyond differential equations from an approved list (http://abe.illinois.edu/graduate/handbook/)	3-4
	One course in statistical design and analysis from an approved list (http://abe.illinois.edu/graduate/handbook/) ¹	3-5
	At least one course in statistical design and analysis from an approved list (http://abe.illinois.edu/graduate/handbook/)	3-5
	At least one course in instrumentation and measurement from an approved list (http://abe.illinois.edu/graduate/handbook/)	3-5
	In addition to above 3 courses in math, stats, and instrumentation, the student is required to take two more courses from any of the three areas (math, stats, or instrumentation) above	6-10

Two 500-level courses (taken for at least 3 credit hours) in an area of specialization – chosen in consultation with advisor	6-10
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)	21-34
ABE 599 Thesis Research	40
Total Hours	96

Other Requirements and Conditions (may overlap)

Requirement	Description
Other Requirements and Conditions may overlap	
A maximum of 4 hours of ABE 597 (or other independent study) may be applied toward the elective course work requirement.	
Two 500-level courses must be formal coursework, not seminar courses, special topics or independent study.	
A maximum of 6 hours of ABE 597 (or other independent study) may be applied toward the elective course work requirement.	
Teaching experience determined in consultation with advisor with guidance provided by the department's Graduate Handbook.	
The minimum program GPA is 3.0.	
A Masters degree is required for admission to the Ph.D. program.	
Ph.D. exam and dissertation requirements:	
Preliminary exam	
Final Exam or dissertation defense	
Dissertation deposit	
Qualifying requirements review in the 2nd year. It is required to complete all courses in math, stats, and instrumentation by the 3rd semester with a 3.25 or higher GPA.	
Preliminary exam	
Final Exam or dissertation defense	
Dissertation deposit	

EP Documentation

DMI Documentation

Banner/Codebook Name

PHD: Agr & Biol Engr -UIUC

Program Code:

10KS5163PHD

Degree Code

PHD

Major Code

5163

Program Reviewer Comments

Deb Forgacs (dforgacs) (Tue, 12 May 2020 21:12:54 GMT):Rollback: request

Deb Forgacs (dforgacs) (Wed, 13 May 2020 16:16:20 GMT):Rollback: workflow fix
Deb Forgacs (dforgacs) (Wed, 13 May 2020 16:34:15 GMT):Rollback: workflow update

Key: 576

64-Credit Hour Curriculum and New 96-Credit Hour Option

Current 64 Credit Hour Ph.D. Curriculum in ABE

<u>ABE 501</u>	Graduate Research I	1
<u>ABE 594</u>	Graduate Seminar (minimum 4 semesters)	0
One MATH course beyond differential equations from an approved list		3-4
One course in statistical design and analysis from an approved list		3-5
One course in instrumentation and measurement from an approved list		3-5
One 500-level course (taken for at least 3 credit hours) in an area of specialization – chosen in consultation with advisor		3-5
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)		10-21
<u>ABE 599</u>	Thesis Research	32
Total Hours		64

Other Requirements

Requirement
Other Requirements and Conditions may overlap
A maximum of 4 hours of <u>ABE 597</u> (or other independent study) may be applied toward the elective course work requirement.
Teaching experience determined in consultation with advisor with guidance provided by the department's Graduate Handbook.
The minimum program GPA is 3.0.
A Masters degree is required for admission to the Ph.D. program.
Ph.D. exam and dissertation requirements:
Preliminary exam
Final Exam or dissertation defense
Dissertation deposit

New 96 Credit Hour Ph.D. Option in ABE

<u>ABE 501</u>	Graduate Research I	1
<u>ABE 594</u>	Graduate Seminar (minimum 6 semesters)	0
At least one MATH course beyond differential equations from an approved list		3-4
At least one course in statistical design and analysis from an approved list		3-5
At least one course in instrumentation and measurement from an approved list		3-5
In addition to above 3 courses in math, stats, and instrumentation, the student is required to take two more courses from any of the three areas (math, stats, or instrumentation) above		6-10
Two 500-level courses (taken for at least 3 credit hours) in an area of specialization – chosen in consultation with advisor		6-10
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)		21-34
<u>ABE 599</u>	Thesis Research	40
Total Hours		96

Other Requirements

Requirement
Other Requirements and Conditions may overlap
Two 500-level courses must be formal coursework, not seminar courses, special topics or independent study.
A maximum of 6 hours of <u>ABE 597</u> (or other independent study) may be applied toward the elective course work requirement.
Teaching experience determined in consultation with advisor with guidance provided by the department's Graduate Handbook.
The minimum program GPA is 3.0.
Ph.D. exam and dissertation requirements:
Qualifying requirements review in the 2 nd year: It is required to complete all courses in math, stats, and instrumentation by the 3 rd semester with a 3.25 or higher GPA.
Preliminary exam
Final Exam or dissertation defense
Dissertation deposit

Ph.D. Degree	Entering with approved MS Degree (64-credit hour curriculum)	Entering with BS Degree (96-credit hour option, consisting of the 64-credit hour curriculum to the left plus 32-credit hour equivalent to MS curriculum)
Total credit towards degree	64 hours	96 hours
ABE 599 Research (minimum applied toward degree)	32	40
Elective Coursework	32	56