



Agricultural and Biological Engineering

**ABE Graduate Student
Policies & Procedures Manual
August 2022 - July 2023**

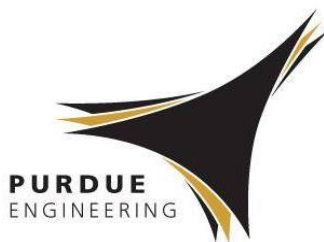


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ABE Graduate Student Manual

Welcome

Welcome to Purdue University and the Department of Agricultural and Biological Engineering (ABE)! We are delighted that you will be joining us in ABE and are excited to be a part of your professional journey. The purpose of this manual is to acquaint you with the graduate policies and the Department of Agricultural and Biological Engineering at Purdue University.

All graduate programs at Purdue University are under the jurisdiction of the Graduate School. In this way certain standards are maintained across the university. These standards include course credit, plan of study format, advisory committee structure, vacation policy, registration requirements, as well as admissions. Under these general guidelines, the Agricultural and Biological Engineering Department has a Graduate Committee that reviews programs and establishes departmental guidelines and policies which are presented in this manual.

We believe that you will find your journey meaningful and intellectually challenging. We encourage you to take advantage of the vast resources and opportunities available to you at Purdue University as you strive to reach your professional and personal goals. If you have any questions or need further information, please contact Senior Graduate Program Administrator Nikki Zimmerman at nzimmerm@purdue.edu.

Graduate Chairs

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1. Degrees, Concentrations, and the Graduate Certificate

All applicants are required by the Graduate School to hold a bachelor's degree from a college or university of recognized standing prior to registration and should have achieved a grade point average of 3.0 on a 4.0 scale, or higher. Three-year degrees may also be accepted, however, these are evaluated and approved on a case-by-case basis.

1.1. Master's Degrees

Master of Science (MS) programs are directed by professors who work in close association with the graduate student. In practice, programs are composed of formal courses, guided individual study in a chosen field or discipline, study in such associated subjects as may be required by the candidate's advisory committee, and original research that serves as the basis of a scholarly thesis. A standard thesis-based MS degree requires 21 credits of formal coursework and an additional nine (9) credits of research requirements with the student's work culminating in a written thesis.

A non-thesis MS degree requires 30 credits of formal coursework, and, in some cases, a final project. Non-thesis master's students are not required to have a committee, only the major professor will be listed in the Graduate School plan of study.

Admission to the Graduate Program at the master's level is restricted to those with an excellent undergraduate record who show potential for graduate success.

ABE offers two master's degrees for those students with strong undergraduate academic records. These include:

- Master of Science in Agricultural and Biological Engineering (MS-ABE): generally, for students with a baccalaureate engineering degree, and
- Master of Science (MS): for students with non-engineering baccalaureate degrees.

Master of Science in Agricultural and Biological Engineering (MS-ABE)

Students who have received a Bachelor of Science in Engineering from an ABET (Accreditation Board for Engineering and Technology)-approved engineering program are normally admitted to this program. The guidelines for an engineering degree are defined by ABET to include 32 hours of engineering sciences, math requirements, and at least 16 hours of design courses.

International students are also eligible for the MS-ABE degree, if their undergraduate degree is in engineering, or a closely related program. Given the diversity of engineering programs and educational systems throughout the world, the Purdue ABE Graduate Committee may ask the student to document their eligibility for this degree option. In this case, the student may be asked to list their courses and to provide translations of any catalogue descriptions not found in English, which correspond to the 32 hours of engineering sciences, math requirements, and at least 16 hours of design, as specified above.

Members of the ABE Graduate Committee will ultimately decide whether an applicant is eligible for admission to the program.

Master of Science

Admission to the Master of Science program is available to graduates with non-engineering baccalaureate degrees. Students with a bachelor's degree in Agricultural Systems Management, or an equivalent area, are normally admitted to this degree program. Such students must have demonstrated an acceptable level of performance at the undergraduate level in the areas of biological sciences, chemistry, physics, mathematics, economics, management, and have thorough knowledge of computer use for communications and problem-solving.

International students are also eligible for this degree. The ABE Graduate Committee may ask the student to provide documentation that demonstrates an equivalent academic background. Members of the ABE Graduate Committee will ultimately decide whether an applicant is eligible for admission to the program.

BS/MS Combined Degree

ABE's combined BS/MS Degree Program is restricted to undergraduate students in high academic standing. Application and admission to the Graduate School are required, and the standard Graduate School application process is to be followed. This degree is also referred to as an early admission program. Students desiring admission into ABE's BS/MS Degree Program can apply to the Department's Graduate Programs Committee as early as their junior year (Semester 5). The Committee will consider the following criteria for admission into the BS/MS Program:

1. the student's undergraduate GPA (60 or more credits; minimum GPA of 3.5),
2. the student's GRE scores (currently waived through the fall 2023 admission cycle),
3. a formal statement of interest by the student,
4. a nomination letter from a sponsoring faculty member (in addition to the required three letters of recommendation), confirming that the faculty member is willing to serve as the student's mentor upon entering the program, stating that the student is an outstanding undergraduate student with the potential to successfully complete a BS and MS degree, and who wishes to expedite their education beyond the undergraduate level, and
5. three letters of recommendation.

The primary purpose of admitting outstanding undergraduate students into the MS degree program is to provide them the opportunity for an early start on their thesis research. BS/MS students are allowed to enroll in graduate courses and earn course and research credits towards their master's degree while completing their bachelor's. Before the baccalaureate degree is awarded, any course and/or research credits taken to satisfy the graduate degree requirements must be designated as undergraduate excess credits on the appropriate university form. Students must meet all requirements for the baccalaureate degree, which must be awarded before the student is eligible to earn the graduate degree.

All students are assigned, or will select, a faculty mentor/thesis advisor upon entering the program. In order to help students plan, the master's advisory committee must be chosen during their first semester in the program. Working with this committee (which includes the major professor), students need to develop a Research Proposal for their thesis and complete a plan of study that documents the graduate courses to be taken. Both documents must be submitted and approved by the ABE Graduate Committee prior to the end of the first semester of registration. Without an approved research proposal and plan of study, dual degree students will not be allowed to register for graduate courses and research credits beyond their first semester. It is expected that students complete a research-based master's thesis at the completion of their BS/MS program. Switching to a non-thesis M.S. would only be possible in the case of unforeseen circumstances and would require specific approval from the Head of the ABE Graduate Program.

BS/MS students are eligible for assistantship and fellowship support after admission to the Graduate School. However, in most cases they are **no longer eligible for financial aid.**

Provisional Admission Status for Students without an Engineering Degree

Applicants not meeting the requirements for full admission to the MS-ABE program are sometimes granted provisional admission to make up academic deficiencies in order to meet the guidelines for an engineering degree as defined by ABET, which include 32 hours of engineering sciences and at least 16 hours of design courses (48 hours total). The general requirements for admission to provisional status are established by the Graduate School.

Applicants with BS degrees from non-engineering or non-accredited programs who possess an undergraduate GPA greater than 3.5 may be admitted to provisional status while completing credit. A minimum of 15 credit hours of remedial undergraduate engineering courses from the five categories listed below are required (some areas of study may require more, as agreed upon by the applicant and the major professor and approved by ABE Graduate Program Committee). Credit for these remedial courses may be applied from equivalent courses from the applicant's BS degree, subject to approval by the major professor and the ABE Graduate Program Committee. The selection of courses from the five categories is left to the student and subject to the approval of the student's major professor and advisory committee.

The decision to provisionally admit a student ultimately rests with the ABE Graduate Program Committee. The equivalent of 2 semesters of engineering physics and 4 semesters of mathematics (through differential equations) are prerequisites for the engineering courses and must be considered part of the remedial coursework if the applicant's background does not include them. Two suggested remedial course plans of study are given below:

Agricultural Engineering:

1. Engineering Statics (ME 27000 or equivalent)
2. Engineering Dynamics (ME 27400 or equivalent)
3. Thermodynamics (ABE 21000, ME 20000, or equivalent)

4. Fluid Mechanics (ME 30900, CE 34000, or equivalent) – also called Hydraulics, Momentum Transfer
5. Mechanics of Materials (NUCL 27300, or equivalent) – also called Strength of Materials

Biological Engineering:

1. Thermodynamics (ABE 20200 or equivalent)
2. Advanced Thermodynamics (ABE 30300 or equivalent) – also called Physical Chemistry
3. Fluid Mechanics (ABE 30700 or equivalent) – also called Hydraulics, Momentum Transfer
4. Heat and Mass Transfer (ABE 30800 or equivalent)
5. Kinetics and Reaction Engineering (ABE 37000 or equivalent)

Remedial courses at the 10000, 20000 and 30000 level cannot be listed on the student's graduate plan of study. Courses completed in addition to the above suggestions, which meet the 32 credit hours of engineering science and 16 credit hours of design (48 hours total), may be applied toward the requirements of completing the MS degree. A maximum of 6 hours of 40000-level (at a grade "B" or higher) and any 50000-level engineering science or design courses may be listed on the student's MS degree plan of study if approved by the student's major professor and ABE Graduate Program Committee.

Depending upon the applicant's background and work experience, completion of at least one 400 or 500-level engineering design course is required, and a senior capstone engineering design class (ABE 48500 or ABE 55600) is strongly encouraged.

Full status is generally granted when the minimum of 15 credit hours of remedial undergraduate engineering courses from the five categories listed above have been completed with a GPA of 3.0 or higher. Full status implies that the student continues to complete remedial courses to meet the ABET definition of a BS engineering degree, and courses required under the student's MS degree plan of study.

1.2. Doctor of Philosophy Degree

Ph.D. programs are directed by professors who work in close association with the graduate student. In contrast to the various master's degrees, the Purdue doctoral degree is not designated by department or by area of specialization. Only concentrations and majors are recorded on graduate transcripts, not minors. The Ph.D. is available to qualified students desiring either an engineering, technology, or systems management program in the Agricultural and Biological Engineering Department.

Admission to the Ph.D. program is contingent upon the satisfactory completion of a MS degree in an Engineering, Technology, Sciences, or Agricultural Systems Management program. If the MS is received from Purdue University, a recommendation of the examining committee is also required, which will be stated in the MS Exam Rubric.

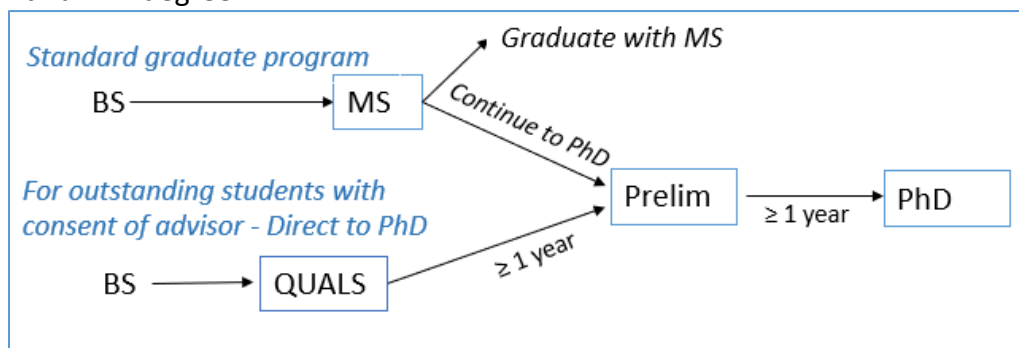
Doctoral programs are composed of formal courses, successful completion of oral and written preliminary exams (see Section 5.1), guided individual study in a chosen field or

discipline, study in such cognate subjects as may be required by the candidate's advisory committee, and original research that serves as the basis of a scholarly thesis. A Ph.D. requires 42 hours of formal coursework beyond the BS (normally 21 credits beyond the MS), and an additional 48 credits of research with the student's work culminating in a written dissertation.

Request for admission of a student who has received an MS degree in another department or university will be carried out through the established Graduate School and Department of Agricultural and Biological Engineering application procedures.

1.3. Direct-to-Ph.D. Option

Students with an outstanding record at their undergraduate institution who are entering the program on a PhD-track without an MS may choose the Direct-to-PhD option. Students choosing this option will be required to complete the PhD Qualifying Sequence (QUALS) as described below. If successful, they will continue to the Preliminary Exam one to two years later and must meet all other requirements of all PhD students to graduate with a PhD degree.



The Direct to PhD is an alternative track to the PhD for some outstanding students that do not wish to complete an MS.

A. PhD QUALIFYING SEQUENCE OVERVIEW AND TIMELINE

The purpose of the Qualifying Sequence is to ensure that the student is prepared to conduct independent research as demonstrated by the student's ability to effectively summarize the literature in their research area; propose appropriate hypotheses or research questions that will advance knowledge; and, to develop appropriate research studies to test the hypotheses and answer the research questions. The Qualifying Sequence consists of three parts:

1. Student performance in coursework to ensure that the student demonstrates understanding of and ability to apply key principles in their Area of Specialization at the graduate level. (see 1.3)
2. Request by the student, with approval from the student's research advisor, to proceed with QUALS. (see 1.4)
3. Preparation and defense of a written report on their research and an oral presentation of the report. (see 1.5 and 1.6)

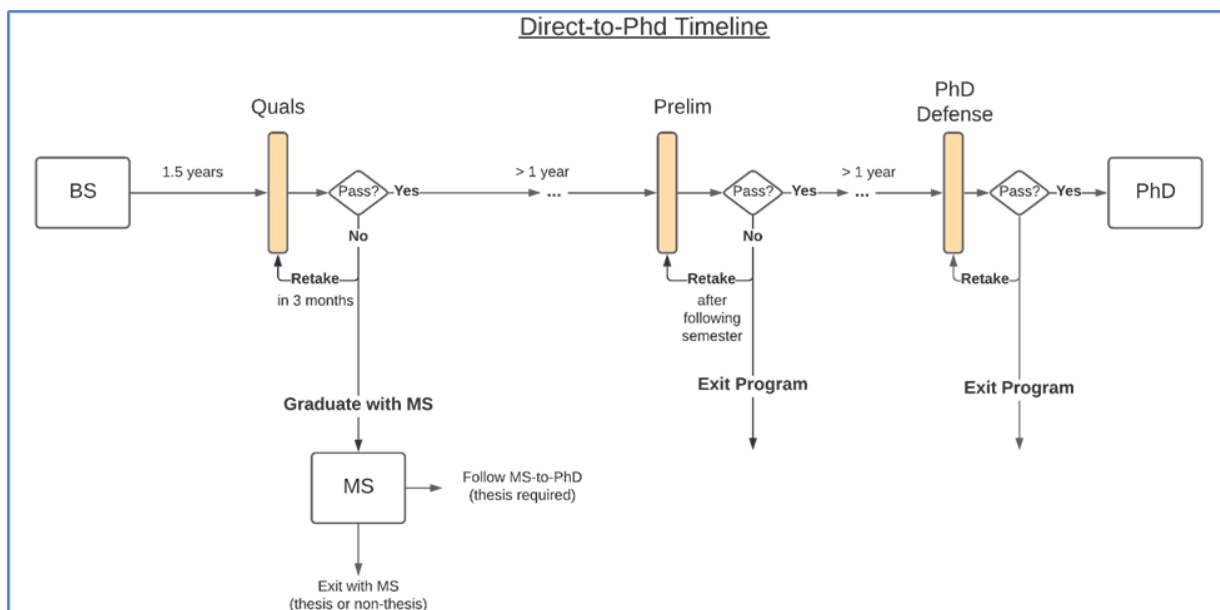
Students should attempt the QUALS in the semester after they have completed one year (i.e., Fall for those who entered in the Fall), and are required to complete it by the end of the following semester (i.e., Spring for those who entered in Fall).

MS students may enter the Direct-to-PhD track up to one year after they begin, by submitting a request to the Graduate Program Coordinator with advisor approval.

B. Qualifier Outcomes

Each student's Advisory Committee will be responsible for preparing a short (less than a few sentences) write-up summarizing the results of the examination. Based on an evaluation of the student's coursework and performance in the qualifying procedure, there are four possible outcomes:

1. **Pass:** The student is admitted to the PhD program and must complete all PhD program requirements to be awarded a PhD degree. The QUALS does not replace the PhD preliminary exam, which must be completed at least 1 year after the QUALS date.
2. **Retake:** The student is asked to retake the qualifier (oral, written, or both) by the end of March (October for Spring Admissions);
3. **A) MS required for PhD:** The student must complete an MS (thesis) degree for evaluation for admission to the PhD program by the graduate committee.
B) Graduate with MS: The student may graduate with an MS (thesis or non-thesis) degree. Funding support during completion of the MS degree will be at the discretion of the Major Professor and the Department Head.



Direct to PhD steps and potential outcomes

C. Coursework Performance

Students on a Direct-to-PhD track must complete at least 12 credits of courses from their Plan of Study before their fourth semester (including summer) at Purdue and maintain

an overall GPA of 3.5 or higher. A student who does not maintain this GPA or receives a grade lower than a B in any course may not proceed on a Direct-to-PhD program but may continue on the regular PhD track.

D. Student Request to Proceed Through QUALS

A student on a Direct-to-PhD track must submit a request for QUALS comprising: 1) written approval from research advisors; 2) unofficial transcripts for coursework taken during their graduate program at Purdue; 3) CV. The Request for QUALS must be submitted to the Graduate Program Coordinator at least two weeks before the intended date of the oral exam. As stated in Section 1.1, the QUALS should normally be completed in the semester after a student has completed one year (i.e., Fall for those who entered in the Fall).

E. QUALS Committee

The advisory committee for the QUALS consists of the major professor and at least two other members of the graduate faculty, with at least one member being from outside the Department of Agricultural & Biological Engineering. When the major professor has a courtesy appointment in ABE, the advisory committee should include at least one regular ABE faculty member

F. Written QUALS Research Report

The qualifying written report should review literature in the student's research area, summarize the research plan for the PhD work, with emphasis on the immediate future work (approximately 1 year), and present preliminary results, in about 5,000 words (10 to 20 pages at 1.5 line spacing). This is not expected to be a complete PhD proposal as will be done for the Prelim. A typical written report for the examination will have the following structure:

- Summary
- Introduction
- Research Objectives
- Literature Review and Theory
- Methods and Materials
- Preliminary Results and Discussion
- Plan for Next 12 Months

The student should engage consistently with the advisor at least two months before to coordinate the document. The student should submit the report to the Advisory Committee at least two weeks before the exam. The report will be used as the basis for evaluation along with the student's performance in oral presentation.

G. Oral QUALS Examination

All students must undergo an oral examination on the thesis research and the subjects of relevance to the respective area of specialization in front of the Advisory Committee. Oral examination dates should be scheduled with the Advisory Committee to occur

before the end of the third semester, not including summer (or in rare cases the fourth semester). The student should prepare and print Rubric Forms (Available in Appendix D of the ABE Grad Manual) for each member of the Advisory Committee.

The oral examination will last up to two hours. It begins with a formal presentation from the student to the committee, and is followed by questions and additional discussion. Students should plan their presentation to be around 20 minutes. This presentation should include a brief overview of important concepts in the research area relevant to the thesis topic, a statement of research objectives, a summary of research progress so far (training, methods, results, and analysis), and a research plan for the next 12 months. The presentation will be followed by a question/answer period to allow the student to clarify information for the committee. The committee may ask questions on the presentation, literature review, dissertation topic, and other topics related to the area of specialization. Time should be reserved for a closed-door deliberation among the committee members (in the absence of the student) during which the committee will determine the results of the exam among the choices in section B, complete the rubric, and provide the results to the student.

H. Stipends

Students interested in the Direct-to-PhD program and who are on assistantship will earn a stipend equivalent to that of an MS student until a determination is made following completion of the QUALS (see B). If the student successfully advances to the PhD program (Outcome 1), the student will receive a stipend at the PhD level beginning the semester following the one in which the student takes the qualifier and subject to the availability of funds and continued satisfactory performance. If the determination is that the student retakes the qualifier or first completes an MS before advancing to the PhD (Outcomes 2 or 3A) the student will remain on an MS stipend subject to the availability of funds and continued satisfactory performance. Funding support for students set to graduate with MS degree (Outcome 3B) will be at the discretion of the Major Professor and the Department Head.

1.4. Concentrations

A concentration is used to allow a specialized area of graduate study to be reflected on a student's final transcript. The department currently offers the following:

- Biotechnology (PULSe)
- Biotechnology Innovation and Regulatory Science
- Computational Science and Engineering (CIGP)
- Computational Life Sciences (CIGP)
- Interdisciplinary Ecological Sciences and Engineering (IESE)
- Fluid Power

Approved core courses for these concentrations can be found in Appendix B. Please note that some concentrations offered in ABE are independent of the department.

[Computational Interdisciplinary Graduate Programs \(CIGP\)](#), [Interdisciplinary Ecological Sciences and Engineering \(IESE\)](#), [PULSe](#), an Interdisciplinary Life Science Program, and

Food Science (IFSC) all offer interdisciplinary concentrations in collaboration with the ABE department. Please visit their websites for more information.

1.5. Graduate Certificate

The ABE department offers one Graduate Certificate in Biotechnology Quality and Regulatory Compliance (BQRC). This certificate can be obtained by graduate students or those independent of a degree-granting program at the university. The following four courses are required to obtain the BQRC certificate and take four semesters to complete:

Required core courses (12 credits total)

- ABE 51100 Drug Development (3 cr)
- ABE 51200 Good Regulatory Practices (3 cr)
- ABE 51300 Quality Management, Audits, and Inspections (3 cr)
- ABE 51500 Molecular Basis in Manufacturing (3 cr)

One other Graduate Certificate in [Hybrid Vehicle Systems](#) is available through the School of Mechanical Engineering. Please visit their site for more information.

1.6. Transferring to ABE from another Purdue University graduate program

Requirements

The student must meet the Graduate School's requirements in order to be considered by ABE for a transfer from another Purdue department. This means the student's GPA must be at least a 3.0. The student should be coming from a discipline which closely relates to work done in the ABE department and must be able to demonstrate knowledge of the field of agricultural and biological engineering and articulate how ABE is a good fit for them based on their research goals. Students must have an ABE faculty member willing to serve as their Major Professor.

Materials needed to approve transfer

The student's admissions application will be needed for review by the ABE Graduate Committee. This can be delivered by the student, or by the student's original department.

An unofficial Purdue transcript will be pulled if not submitted by the student.

A Statement of Purpose for Transfer will be written by the student, explaining which degree they are currently pursuing (Master's or Ph.D.), the justification for the transfer, and explaining why ABE is an appropriate fit for the student.

A letter or statement by the ABE major professor justifying the transfer and indicating a willingness to supervise the student.

Process of Assessment

Members of the ABE Graduate Committee will review the file and determine whether the transfer is appropriate for the student and for the department.

2. Major Professor

When admitted to Purdue, most ABE graduate students have already chosen a major professor. If not, they will be initially assigned to one. This initial assignment is based on expressed research interest, the research programs of the staff member, and the availability of research funds. Faculty with courtesy or adjunct appointments are members of the graduate faculties of Purdue and may serve as a major professor or an advisory committee member.

3. Coursework and Plan of Study

3.1. Course Requirements

Master's Degree

Minimum requirements for the program are 21 semester hours of graduate coursework beyond the BS level, and an acceptable research thesis that contributes to knowledge in the field of research specialization. The non-thesis MS requires 30 semester hours of graduate work beyond the BS. At least half must be taken at Purdue University. For either the thesis or non-thesis option, courses taken must include:

- At least three (3) credits of graduate coursework (50000 or 60000 level) in any mathematics, statistics, quantitative data processing and/or data science course. (See Appendix D.)
 - For professional (non-thesis) degrees, this requirement may be met through an approved suite of courses that together provide statistical skills and knowledge equivalent to a 3-credit course in statistics.
- At least six (6) semester hours of graduate credit (50000 or 60000 level) in ABE, ASM, or core courses if identified in a specific Concentration (see Appendix B/C).
- Two (2) semesters of Graduate Seminar, ABE 69400 (typically taken in fall of the first graduate year), and ABE 69600 (typically taken in spring). Class attendance and participation in Graduate Seminar is mandatory and required for graduation. ABE 69400 and 69600 should not be entered on the electronic copy submitted through the Graduate School.

The plan of study should provide a well-balanced and integrated program in support of the student's concentration or area of interest. Students on ½ time or ¼ time assistantship should complete 21 credit hours of coursework within the first twelve months of the student's entry into the department. In cases where the student has a heavy initial research involvement due to the nature of the research, 16 months may be required for coursework completion. The coursework total can include up to 3 credits of ABE 59000 (see Appendix G for the Special Topics Contract), or an equivalent designation in another department. Semester-hour credits for courses transferred from institutions on a quarter-hour system are computed by multiplying the number of quarter-hour credits by 0.75.

Doctor of Philosophy Degree

Minimum requirements for the Ph.D. program are 42 semester hours of graduate work, of which at least 21 semester hours must be beyond the MS level, and the completion of an acceptable research thesis that contributes to knowledge in the field of research specialization. This total can include 3 credits of ABE 59000 (see Appendix G for the Special Topics Contract), or an equivalent designation in another department. At least half of Ph.D. course credits must be taken at Purdue University, not including credits taken to complete the MS degree. Semester-hour credit for courses transferred from institutions on a quarter-hour system are computed by multiplying the number of quarter-hour credits by 0.75. The plan of study should be a well-balanced and integrated program including in-depth work in the concentration or area of interest, breadth in Agricultural and Biological Engineering, and a sound mathematical background including:

- At least three (3) credits of graduate coursework (50000 or 60000 level) beyond the MS degree requirements (6 credits total) in any mathematics, statistics, quantitative data processing and/or data science course. (See Appendix D.)
- At least six (6) credits of graduate coursework (50000 or 60000 level) in ABE, ASM, or core courses if identified in a specific concentration (12 total). (See Appendix B/C for course lists.)
- Three (3) semesters of Graduate Seminar, ABE 69400, ABE 69600, and ABE 69700. ABE 69400 is generally taken in the first fall semester of graduate studies. ABE 69700 is generally taken after the second year of graduate studies is completed. ABE 69600 is generally taken after the student has compiled enough research results to develop a departmental seminar on their work. The three Graduate Seminar courses are not to be listed on the electronic plan of study.

Up to 21 semester hours may be waived from the requirements of a completed MS degree. These semester hours should conform to the requirements for the MS outlined above. Individual courses applied to the MS degree from Purdue University or another institution, should not be listed in the Ph.D. electronic plan of study. Instead, the student's major professor and/or Graduate Program Administrator will enter and approve the total number of semester hours applied from a MS, up to 21 total.

3.2. Plan of Study

Each graduate student admitted to a degree program must file a Plan of Study through the myPurdue portal before the end of the first semester of graduate work. The Plan of Study includes the specific courses the student is expected to complete. No courses that have S/U grades, such as research credits (698 or 699), should appear on the Plan of Study. Nor should any P/NP classes.

Waiver of course requirements (only for Ph.D. students with a MS earned from Purdue University or another accredited institution) are subject to the rules described in section 3.1 and are subject to the approval of the student's major professor and ABE graduate committee. Waived courses from another institution will not appear on the Purdue University transcript. Waived courses applied to a MS earned at Purdue University or another institution should not be individually listed in the student's electronic plan of

study. The major professor (or designee) will enter and approve the total number of waived credit hours (≤ 21) on the electronic plan of study.

Course credits earned by a student whose graduate study and/or professional activity have been inactive for five years or more cannot be used in a plan of study for an advanced degree. A plan of study approved prior to such a period of inactivity is invalid. A preliminary examination passed prior to such a period of inactivity is invalid.

Filing the Plan of Study

An initial plan of study for the MS degree will be developed as part of each new graduate student's successful completion of ABE 69400, the Graduate Seminar Course.

The Plan of Study Worksheet (Appendix A) can be used to outline coursework and to assure that the coursework fulfills the requirements described in section 3.1. The Plan of Study must be approved by the major professor.

The approved worksheet will aid in completing the electronic submission of the plan of study. The Plan of Study is filed electronically and must be completed by the student after his or her major professor has approved. The Plan of Study includes a primary area and related area(s) that are chosen on the basis of the student's interests and needs. It includes the specific courses the student is expected to complete and other requirements of the degree being sought. No research credits (ABE 69800 or 69900) or graduate seminars (ABE 69400, 69600, or 69700), should appear on the plan. No courses taken pass/fail or satisfactory/unsatisfactory may be included in the plan. The initial Plan of Study must be finalized and submitted for approvals before the end of the first semester in a graduate degree program.

The Plan of Study for a Ph.D. must be filed by the end of the student's first academic semester in the Ph.D. program in order to meet departmental requirements. For students who complete a MS degree at Purdue or at another institution, up to 21 credit hours may be waived, subject to the approval of the major professor and the graduate committee. These courses should not be listed individually on the Plan of Study; instead, the total number of credits waived will be entered and approved by the major professor, or designee. See details in Section 3.1.

After the initial electronic plan of study has completed the approval process, it may be amended at any time, subject to the major professor's and graduate committee's approvals.

Credits from Another University

Credits earned at other universities may be applied toward an advanced degree at Purdue, but only if it can be proven that the specific credits were not used to meet requirements for another awarded degree. Further, only credit hours associated with graduate courses for which grades of B- or better were obtained will be eligible for transfer. Please refer to the Graduate School's policies and procedures for Administering Graduate Student Programs

(<http://catalog.purdue.edu/content.php?catoid=10&navoid=12788>) Section VII, part B. 1. A. 6., part B. 1. B. and B. 1. C. All transfer credits are subject to approval by the major professor and ABE graduate committee.

3.3. Course Recommendations

Recommended courses for each area of interest in ABE can be found in Appendix C. These lists are meant to be a starting point for students to help generate ideas for course registration. They are not inclusive of all courses that are offered or acceptable, but a general list of courses that are often recommended by faculty in a given area of interest. When creating a plan of study and registering for coursework, students are expected to work with their major professor to ensure all degree requirements and research expectations are met.

3.4. Course Registration

Registration for all students should reflect the student's activity as accurately as possible. Any student must be registered for research during each semester or summer session when doing research utilizing faculty direction or consultation, and/or requiring the use of University facilities. Research includes literature reviews and thesis writing. Departmental policy requires that each graduate student supported by an assistantship (teaching or research) must be registered as a full-time student each semester.

In fulfilling degree requirements, a maximum of 18 credit hours will be allowed from any one semester (9 credit hours for the summer session.)

Although the minimum registration for full-time status is 8 credits per semester, or 6 credits in the summer, expectations for students funded on research assistantships are higher. **The ABE Department expects students will register for a total of 15 credits during the fall and spring semesters, and 9 credits in the summer.** Although this is a general recommendation, circumstances may lead to different levels of research activity in various semesters and therefore graduate students and their advisors should select an appropriate number of credits each semester.

All MS students must be registered in ABE or ASM 69800 (Research MS Thesis) and all Ph.D. students must be registered in ABE or ASM 69900 (Research PhD Thesis). ABE/ASM 69800 and ABE/ASM 69900 should not appear on the Plan of Study but count toward meeting residency requirements. Early registration is recommended. Late registration will result in additional fees.

Completing the Research Syllabus for Registration

Beginning in Fall 2019, the Graduate School instituted a requirement that each student complete a syllabus for each semester of research credit registration. This syllabus includes general expectations agreed upon by a student and their Major Professor for the semester in question.

In ABE, the generic syllabus found in Appendix E is used both to fulfill this requirement and to allow students to register for research credits. The syllabus should be filled out by the student and approved by the Major Professor. Additional requirements, should they be necessary, are entered in the empty block below the general Research Expectations.

After completion, the student should email the form to the Graduate Program Administrator from their @purdue.edu email account, copying their Major Professor, and

requesting they respond with approval or edits. Once approval is given (also via the faculty member's @purdue.edu email), the Graduate Program Administrator will enter the research credits and communicate with all parties.

Registration and Billing

When registration is completed, fees and payment schedules will be posted on the myPurdue portal. It is the student's responsibility to provide the correct mailing address to the Office of the Registrar, Bursar's Office, and Agricultural and Biological Engineering Department, for billing purposes.

Students employed through an assistantship or fellowship receive tuition remission, which is processed by the ABE Business Office and the Bursar's Office. Please note that some fees are NOT covered by tuition remission. For example, the College of Engineering charges differential fees, and the university charges student health and wellness fees. For more information regarding fees paid by the students, and for information regarding payment plan options, please visit the [Bursar's Office website](#). Additionally, tuition and fees can be estimated using the [Tuition Calculator](#).

Registration and Holds

To check if you have a Hold on your account that may prevent registration, please login to your **myPurdue**, and click on the Registration Tab. In the orange "Register for Classes" box, click on the first link - "**Do I have any holds?**". Common examples of holds that will prevent you from being able to register or obtain official transcripts are:

- **Immunizations** – All Purdue students must have their immunization records on file with Purdue University Student Health (often called PUSH). For office information, see Appendix J.
- **Financial Responsibility** – The Division of Financial Aid requires all Purdue students to acknowledge and accept their responsibility for incurred charges. This hold is placed on every student account before spring registration opens each year. For office information, see Appendix J.
- **Emergency Contact** – The University requires each student list an Emergency Contact. This hold is also placed on every student's account before spring registration opens each year.
- **Outstanding Admission Conditions** (such as missing official transcripts or official diploma) – This is a hold that you may see in your first semester. Many students fail to provide official transcripts or certificates to the Graduate School upon their arrival to Purdue. This hold means you still need to contact the Graduate School Admissions Office to fulfill an admission condition.

3.5. Grade Requirements

The graduate student is expected to perform on a high academic level. Only grades of C- or better are acceptable in fulfilling graduate school requirements on any plan of study. No more than six credits of "C" grades will be accepted toward graduation. The major professor and the advisory committee may require performance of B or better in certain

courses. This requirement must, however, be stated in writing to the student and placed in the student's file at least one month before the student takes the course.

Please note: Pass/no pass grades are not acceptable in fulfilling degree requirements.

All graduate degree candidates must have a minimum of 3.0 (out of 4.0) Grade Point Average (GPA) to graduate. The GPA is computed from all courses on the plan of study. The student's progress will be reviewed each semester by both the Graduate School and the Department. Should the student fail to perform on a level satisfactory to the major professor and the advisory committee, or to the Dean of the Graduate School, he or she may be asked to discontinue graduate study at Purdue University. The same scholastic requirements in effect during the regular university year apply to graduate study during the summer session and in work taken at the university's regional campuses.

In situations where a graduate student does not satisfactorily complete a graduate level course with the grade of C or better, the student may re-enroll in the course only once. The first grade will not be considered in the graduation GPA. If a student receives a D or below in more than one course, the student could lose his/her departmental graduate appointment. In the case of students with fellowships, the sponsor will be notified of the student's unsatisfactory academic performance. A student who falls below the guideline will be notified, in writing, by the Graduate Program Chair and will have one semester in which to raise his/her GPA above 3.0. If the GPA falls below 3.0, the student's grade report will be marked as "low" by the Graduate School. The student must raise their semester GPA above 3.0 the following semester or may be asked to leave the graduate program. A plan of study GPA below 3.0 may result in the loss of the student's assistantship or fellowship.

Graduate students who receive an incomplete grade in any course will have one year from the date the Incomplete was given to receive a completion grade. If that is not done, the Registrar's Office will convert the grade to failing (noted as IF on the official transcript).

3.6. Registration Requirements

The Graduate School requires that one-half of the total credits for the master's degree and one-third of the total credits for the Ph.D. degree be earned at the Purdue University. The ABE Department requires one-half of the total credits for each degree be earned at Purdue University. (See [VI., B. Degree and Registration Requirements](#))

4. Graduate Research

4.1. Advisory Committee

Each student completing the Quals, a thesis master's, or Ph.D. degree must select an advisory committee. The major professor will help identify faculty members who have expertise in the area of research or professional interest. The advisory committee will advise on courses selected for the plan of study, and as needed during the course of graduate studies. Since the advisory committee must approve plans of study, research

project outlines, and theses, the student is responsible for keeping committee members informed of his/her progress. Failure to meet the filing deadlines may result in loss of a student's graduate assistantship, until the process has been satisfactorily completed.

The advisory committee for the Quals and a master's degree consists of the major professor and at least two other members of the graduate faculty. For a Ph.D. degree, the advisory committee should consist of the major professor and at least three other members of the graduate faculty, with at least one member being from outside the Department of Agricultural & Biological Engineering. When the major professor has a courtesy appointment in ABE, the advisory committee should include at least one regular ABE faculty member for both master's and PhD degrees.

4.2. Integrity in Research

Integrity in research is an essential part of Purdue University's intellectual and social structure, and adherence to its spirit and principles must be maintained. These principles include commitment to truth, objectivity, fairness, honesty, and free inquiry. Violations of integrity may result in dismissal from the university.

Serious violations of integrity in research are rare. However, those that do occur strike at the very heart of scholarship and the concept of the university. Advances in scientific knowledge depend on reliable data and honestly reported conclusions. In any academic institution, scholars, researchers, and artists have a special obligation to exemplify the best qualities and highest standards of personal and professional conduct.

All ABE students are required to complete the online training course on Responsible Conduct of Research developed by the Collaborative Institutional Training Initiative (CITI) available at <https://www.purdue.edu/gradschool/research/rcr/>. This is a requirement of the ABE 69400 seminar. Students should also be familiar with policies on responsible conduct of research at the above website.

5. The Preliminary Exam for Ph.D. Students

Admission to candidacy for the degree of Doctor of Philosophy takes place only after the student has passed the preliminary examination. (Note that this is not the same as candidacy for graduation.) After admission to candidacy, a Ph.D. student must devote at least two semesters to research before taking the final examination. Request for the final examination must be made at least two weeks prior to examination date.

5.1. Preliminary Exam for Ph.D.

Advancement to Ph.D. candidacy requires successfully passing preliminary examinations by the student's graduate committee. A student must be enrolled for at least 2 full semesters (summer is counted as a semester) between successful completion of the preliminary exams, and the defense of the dissertation, (e.g. If the prelim is completed in Fall 2021; the final defense can be held in Fall 2022 or later).

The preliminary examination process includes written and oral examinations. Both the written and oral examinations are administered by the student's major professor and the preliminary examining, or thesis advisory committee. These examinations are to determine if the student has an adequate understanding of his/her research program, has a reasonable plan for completing the research, and has the necessary academic background and capability to successfully conduct the research. The preliminary examinations consist of three parts: 1) written examination, 2) research proposal, and 3) oral examination.

The **written examination** should be comprehensive and should include subject matter other than material directly related to the student's specific Ph.D. research topic. The format and content of the written examination is developed by the student's major professor and the preliminary examining/thesis advisory committee. The written examination will be given to the student with clear instructions for completion, allowable resources to be used, etc. The written examination will be submitted to the major professor and preliminary examining/thesis advisory committee upon completion. The graded exam will be returned to the student in a timely manner by the examining committee. The written exam must be passed before proceeding to the oral examination.

The **research proposal** should follow a format as determined by the student's major professor and preliminary examination/thesis advisory committee. A general outline that may be followed is shown below. Specific expectations for the format, length, and content of the research proposal should be set by the major professor and communicated to the student. The research proposal should be submitted to the examining/thesis advisory committee at least two weeks prior to the oral examination.

Suggested Research Proposal Outline:

1. Justification of Research Question(s)
2. Dissertation Goals or Objectives
3. Summary of Preliminary Results
4. Proposed Methodology
5. Anticipated Results
6. Timeline

The **oral examination** should include a presentation by the student summarizing their research proposal. As students should be meeting with their advisory committee on an annual basis to discuss their research progress, the presentation normally provides an update on prior results, or a summary of work to date. The bulk of the oral presentation should focus on the proposed methodology, data collection plans, data analysis, anticipated results, and timeline. The exact format, length, and content should be followed as directed by the major professor. The preliminary examination/thesis advisory committee is expected to ask the student questions about their research and any other relevant topic, including material from their written exam.

At least 2 weeks prior to the oral examination, a Request for Appointment of Examining Committee (electronic G.S. Form 8), must be filed by the student and approved by the

student's major professor. At or after the oral exam, committee members will be asked to complete the *Rubric for Research Proposal and Preliminary Exam*.

If the report of the examining committee is unfavorable, the student may repeat the examination after the following semester or summer session, at the recommendation of the examining committee. Should the preliminary examination be failed twice, the student may not be given a third examination, except on the recommendation of the examining committee and with special approval of the Dean of the Graduate School.

Please refer to the following chart for a simplified outline of this timetable:

Preliminary Exams Timeline

What	When
Confirm that your plan of study has been approved by the Graduate School.	At the beginning of the semester in which you take your exams.
Discuss the schedule and format for your preliminary exams and research proposal with your major professor.	Near the beginning of the semester in which you take your exams.
Complete your Written Preliminary Exam .	At least 3 weeks before your Oral Preliminary Exam is scheduled.
Submit electronic Form 8 to Graduate School.	<i>At least</i> 2 weeks before the Oral Preliminary Exam .
Submit your Research Proposal to your committee.	As directed by your major professor (2 weeks before your Oral Preliminary Exam is common).
Complete your Oral Preliminary Exam .	<i>At least</i> 2 weeks after submitting GS Form 8, but <i>before</i> the published semester deadline.

For information regarding how to submit an electronic Form 8, visit https://www.purdue.edu/gradschool/downloads/ExamForms_Guidelines.pdf

6. Thesis and Defense

6.1. Declaring Candidacy for Graduation

Graduate students must declare candidacy for the semester in which they intend to defend their thesis or dissertation and have their degree awarded. [The Graduate School Deadlines Calendar](#) provides the dates by which requirements must be completed, normally 1-2 weeks before the end of the semester. It is the student's responsibility to communicate graduation intentions with their major professor and the Graduate Program Administrator during the registration period for any given semester. Candidacy for graduation is only valid for one semester and does not carry forward to other semesters if the thesis/dissertation defense and submission deadlines are missed. Should a student miss the deadlines for graduation, they can register as many times as needed. However, any student registered for candidacy in 3 consecutive semesters will be assessed a \$200 fee by the Graduate School.

A “CAND” course, either 99100, 99200, or 99300 should appear on the student’s registration for the appropriate semester of their graduation.

It is the student’s responsibility to confirm that the coursework on their plan of study matches the coursework actually taken at Purdue.

Appropriate CAND course registrations:

CAND 99100 (General Candidacy)	CAND 99200 (Degree only)	CAND 99300 (Exam only)
Students plan to fulfill all requirements during the semester. (See Graduate School Deadlines Calendar for due dates.)	Students must have met all degree requirements, except for depositing. Satisfactory research is required in the previous session, and students must meet a mid-semester deadline.	Students must have met all degree requirements, except for defending and depositing. Satisfactory research is required in the previous session, and students must meet a mid-semester deadline.

*If assistance is needed in deciding which CAND course is correct, contact the ABE Grad Program Administrator.

CAND 99200 and CAND 99300 are considered a “privileged registration” status which results in lower fees, but **not** in full-time student status. As a general rule, students registered for CAND 99200 or 99300 may NOT be funded (supported on an assistantship). Be aware that most students who select option 2 or 3 leave campus before semester’s end.

6.2. Thesis or Dissertation

The final product of most graduate research programs is a thesis or a dissertation. This document represents the diligent and original work of the student. Care should be taken to be sure this document is of high quality. The thesis or dissertation must be distributed to the advisory committee at least two weeks before the final exam is given. Please see Appendix I and visit the Thesis/Dissertation Office’s website for instructions regarding formatting, running iThenticate, and other submission questions.

The Graduate School requires a specific format for all theses and dissertations. Detailed information on formatting your thesis or dissertation can be found at the Graduate School’s Thesis/Dissertation Office Website:

<http://www.purdue.edu/gradschool/research/thesis/>. Each student is responsible for completing and submitting these as required by the Graduate School. In the ABE Department, authority for approving the thesis/dissertation format has been delegated to chairs of the final examining committee.

6.3. Final Exams

A final oral examination is taken after the completion of all course work and the thesis or dissertation. This exam may cover any material in the candidate's program, but typically is

a defense of the thesis or dissertation. In the case of Ph.D. candidates, at least two semesters of devoted research must lapse between the semester of the preliminary exam and the semester of the final dissertation examination.

Final examination requests must be approved by the Department Head and received by the Graduate School at least two weeks before the examination date. A final oral examination will be given to candidates before the completion of requirements of the graduating student. Once you have passed the final examination for your degree, your chair and examining committee members will electronically sign the Graduate School Examination Report (GS Form 7 for master's candidates or Form 11 for doctoral candidates). Once other required signatures are secured, the report is finalized in the Graduate School.

Students should have paper copies of the appropriate rubrics for each member of their committee. Committee members should complete the rubric forms and submit originals or copies to the Graduate Program Administrator and provide a summary to the student.

Please refer to Appendix H for the ABE Timelines.

6.4. The Deposit Process

Both MS and Ph.D. theses/dissertations are required to be submitted electronically to the Purdue Graduate School for review. An electronic PDF file of all theses/dissertations will be uploaded to the Hammer Research Repository (HammerRR). A final copy of the thesis/dissertation should be delivered to the major professor and committee members, or as the major professor dictates. Please visit the Thesis/Dissertation Office's Deposit Process website for more information:

<https://www.purdue.edu/gradschool/research/thesis/requirements.html> and review Appendix I for a simple checklist or visit the website listed above for complete documentation.

7. Other Policies

7.1. Graduate Students' Right to Appeal

Student Conduct

Graduate students, like all students officially enrolled at Purdue University, are subject to all university regulations. At the same time, their rights as individuals and as students are duly protected. Graduate students who feel that their rights have been violated by a disciplinary decision may seek redress through the Community Standards Board, according to procedures specified in [Regulations Governing Student Conduct, Disciplinary Proceedings, and Appeals](#), Section C-8 of the University Regulations, Student Conduct Policy.

Academic Standards

Graduate students must be proactive in matters pertaining to their academic program, coursework, and research. It is recommended that all graduate students in ABE meet with

their advisor at the beginning of each semester to be certain both the student and advisor understand and agree upon expectations regarding registration, research credits, and other academic matters. While this should help avoid any major issues before they arise, there are Graduate School and University processes in place should more guidance be necessary.

Graduate students who wish to appeal decisions concerning matters of academic standards may seek redress according to procedures specified in the [Student Conduct Policy, Regulations Governing Student Conduct, Disciplinary Proceedings, and Appeals](#), Section E-Grade Appeals System, of University Regulations and to the procedures detailed in Graduate Council Document 91-C which have been established in accordance with the authority thereby delegated to the Graduate Council. Further information regarding graduate student Appeals Concerning Academic Standards can be found in the [Policies and Procedures for Administering Graduate Student Programs](#), section IX, A. Student Conduct and Rights of Appeal.

7.2. Nondiscrimination Policy Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Purdue's Equal Opportunity, Equal Access and Affirmative Action policy which provides specific contractual rights and remedies. Additionally, the University promotes the full realization of equal employment opportunity for women, minorities, persons with disabilities and veterans through its affirmative action program.

Any question of interpretation regarding this Nondiscrimination Policy Statement shall be referred to the [Vice President for Ethics and Compliance](#) for final determination.

8. Professional Development

8.1. Professional Societies

Attendance at professional meetings and membership in professional societies is encouraged. In most cases travel and lodging are the student's personal responsibility except in cases where project funds are available for this purpose. The Department often arranges a van to attend the annual American Society of Agricultural and Biological Engineers meeting. Many professional and research associations have branches on campus such as Sigma Xi and Alpha Epsilon. Students are expected to be active in professional societies while pursuing advanced degrees at Purdue University.

8.2. ABE Graduate Student Association

Students are encouraged to participate in the Agricultural and Biological Graduate Student Association. The ABE GSA is an organization made up of graduate students dedicated to improving the experience of their fellow graduate students in the ABE department at Purdue University. Please visit their website for more information:

<https://engineering.purdue.edu/abegsa/>

8.3. Graduate Student Awards

As part of both the College of Agriculture (COA) and the College of Engineering (COE), graduate students in the ABE department may be eligible for many awards annually. Award opportunities that are typically offered annually are listed below, although any of these may change each year. The Graduate Program Administrator sends email notification to all graduate students of specific awards, application materials needed, and deadlines, which graduate students are responsible for meeting if they wish to be considered.

The list below includes those that are evaluated and decided upon in the department, including those awards for which we nominate a candidate, who may or may not receive the award. A brief, partial description is given, please see actual award criteria for specific information.

Award	Typical Deadline (subject to change)	Description
Outstanding Graduate Research Award (COE)	February	Based on publications, awards for research and contribution to research field and society
Magoon Teaching Award (COE)	February	Must have half-time teaching assistantship and other eligibility as determined by COE
Outstanding Graduate Service Award (COE)	February	Service to the department, college, university, and community
Graduate School Excellence in Teaching Award (Nomination to Graduate School)	February	Eligible students are contacted by ABE Grad Admin, students must have been awarded Magoon or Teaching Academy Award previously.

Teaching Academy Graduate Teaching Award	February	Eligible students are contacted by ABE Grad Admin, students must have been awarded Magoon previously.
ABE Outstanding MS and PhD Awards	April	Based on research contributions, academic excellence, teaching or mentoring, and service to ABE
Bilsland Dissertation Fellowship (COA – 1 semester, cannot be used in summer)	April	For Ph.D. students in final year. Selection based on funding need, merit, service, and career promise
Bilsland Dissertation Fellowship (COE – 1 year of support)	December	For Ph.D. students in final year. Selection based on funding need, merit, service, and career promise

9. Graduate Student Employment

9.1. Workloads of Students with Graduate Staff Appointments

Most graduate students in the Agricultural and Biological Engineering Department are supported by half-time research or teaching assistantships. Purdue, like many other major research universities, assumes that a half-time appointment constitutes a contract for 20 hours of service per week. If an assistant's duties are independent of the student's course work and research, the definition of the half-time work load is relatively straight forward: not more than 20 hours per week.

All graduate assistants should realize that research relating to their degree is not included in the 20 hours, and must be done in addition to the 20 hours the half-time appointment involves. Nearly all students will register for research course hours (ABE 69800 or ABE 69900) every semester to account for the time spent on research in the lab, field, or desk each week beyond their work as a research or teaching assistant. Disputes between graduate assistants and major professors should be discussed between the parties involved, and moderated by the Department Head if necessary. See the Purdue University [Graduate School Policies and Procedures for Administering Graduate Student Programs](#) in the University Catalog: <http://catalog.purdue.edu/> for additional information.

For those students on $\frac{3}{4}$ or full time assistantships, the time guidelines above will be modified to account for the reduced course load restrictions due to such appointments.

To be eligible to hold a graduate staff appointment during any session, an individual must be enrolled as a degree-seeking graduate student and be registered full time for the duration of each semester during the entire appointment period. Graduate staff on appointment during the summer are obligated to register for a minimum of 9 graduate hours during at least one of the summer modules.

9.2. Vacation and Sick Leave Policy

As staff of the department, graduate research assistants receive 22 days of vacation per fiscal year. These vacation days do not automatically occur during university breaks, unless vacation is requested. Vacation or other absences from the Department can be requested through SuccessFactors. Those graduate assistants employed only during the academic year are not paid during university breaks and are not required to use vacation.

Graduate student fiscal-year staff terminating their employment with the University forfeit any unused vacation allowance. This allowance will not be paid to the staff member, nor may their appointment be extended to cover any unused vacation.

Official holidays are announced annually by Purdue's president and provide for additional leave days.

Up to two weeks (10 working days) per year sick leave and 15 working days per year military leave (with pay) may also be granted. Benefits-eligible graduate staff are eligible for paid bereavement leave due to death in the immediate family. Up to five workdays over six consecutive calendar months are allowed. Up to one workday for the death of extended family members, or fellow employees. All graduate students must complete a sick leave form upon returning to work for time missed due to illness.

For specific details regarding leave, bereavement, sick leave, etc. please see the Graduate Student Employment Manual, available at:

<http://www.purdue.edu/gradschool/documents/gpo/graduate-student-employment-manual.pdf> and the Graduate Student Staff Benefits policy at <https://www.purdue.edu/policies/human-resources/s3.html>.

9.3. Student Offices

Graduate students that are employed by the ABE Department are assigned office space, as available, when they begin their studies. The ABE Schedule Deputy is in charge of assigning office space. Any requests for changes in the graduate student offices must be submitted to the Schedule Deputy.

9.4. Keys

Graduate students are also assigned keys so that they can enter the building after it is officially closed. The outside doors are open to the public Monday- Friday 6 a.m. to 8 p.m. A key request form can be obtained from the ABE Administrative Assistant. The form should be signed by the major professor and returned to the ABE Administrative Assistant to obtain keys. Keys must be returned and the proper space on the checkout sheet signed by the Department Head before your degree will be awarded and your last paycheck approved.

9.5. Travel

Travel Requests and Reimbursement

Requests for university-related travel outside Tippecanoe County must be submitted at least two weeks in advance. Trip requests are completed electronically through Purdue's Concur Travel System. Requests for reimbursement of travel expenses are made through Purdue's Travel System once the traveler returns and has completed the expense report. Reimbursements may not be made for trips for which prior approval was not requested and granted. **Please inquire with the ABE Business office to help through this process.** See the following web page for more detailed information:
<http://www.purdue.edu/business/travel/index.html>

At the time of publishing this manual, additional travel restrictions are still in place due to COVID. Any travel outside of Indiana requires a Travel Waiver. The current travel restrictions can be found at <https://www.purdue.edu/procurement/travel/spend-reduction/index.php>. Consult the Business Office with further questions.

Departmental Vehicles

Vehicles are available in ABE for transportation on project work. Students using these vehicles must possess a valid U.S. drivers' license. Please be aware that you will need to allow approximately 5 business days for processing of Driver Authorization Requests, which must be secured PRIOR your first use of a Departmental Vehicle. The Driver's Authorization form is completed through iLab under ABE's Vehicle Recharge. Please inquire through the Business Office on the process.

ABE Vehicles are to be reserved through the iLab System. Keys can be obtained for those vehicles from the Main Office. The Main Office can help with this process. Vehicle problems and accidents are to be reported to the Building Deputy. Seat belt use is mandatory in all university vehicles.

University Transportation

For trips which may take more than one-half day, cars and vans may be obtained from the University Transportation Department (<https://www.purdue.edu/transportation/>). The vehicle must be requested in advance by telephone or email, and the Vehicle Rental Form (Form 1) filled out and signed by the ABE Business Office. It must be presented to the University Transportation Service when picking up the vehicle. Students using university vehicles must possess a valid driver's license and are an approved driver through Risk Management.

9.6. Safety

All graduate students are required to attend a Hazard Communication training session. This will include a short segment on the proper use of Personal Protective Equipment. The training will be conducted in the ABE Department by the Safety Committee Chair.

10. Resources for Graduate Student Research

10.1. Fabrication of Research Equipment

Research equipment is often constructed for specific projects. The Department and University can provide students with help in the construction of this equipment. The

departmental Shop Manager can provide assistance and advice for your specific research needs.

Shop

The express purpose of the shop is to build or assist in building research apparatus along with assisting with senior design projects. It is not for personal use. The procedure for obtaining assistance in the shop is as follows: (1) in consultation with your major professor determine what type of equipment is needed for your research; (2) develop an engineering drawing clearly showing the apparatus desired, giving necessary dimensions, sizes, type of material, and notes for its fabrication; (3) provide an account number for acquisition of components and material; (4) discuss your project with the Shop Manager. In some cases it may be necessary for you to assist the Shop Manager or his assistants in the work.

There is a short safety training course required for students to work in the Shop. Students with Machine Shop experience are allowed to assist with projects. The Shop hours are 7:30- 3:30 Monday-Friday.

Tools

Tools may be borrowed from the ABE Shop. Return tools as promptly as possible. If you break a tool, inform the Shop Manager so it can be replaced or repaired. If you need a certain tool and do not find it, ask the Shop Manager for assistance. Tools can be borrowed from other University Shops.

Research Machining Services

Research Machining Services (RMS) is equipped and staffed to perform work requiring precision machining, machining on large work pieces and specialized fabrications which cannot be performed economically in departmental machine shops. Material for student projects can be purchased from RMS by going through the ABE Machine Shop Manager. Work orders are available from the Machine Shop Manager and must be submitted by the Machine Shop Manager.

10.2. Printing and Photocopying

Use of the photocopiers for research must be approved by your major professor. Duplicating services are also available at several locations on campus. Each student is expected to pay the cost of reproducing their thesis/dissertation. Physical copies of the thesis/dissertation are not required for submission, but students should ask their major professor if they want a physical copy before printing.

To make copies for your Major Professor, obtain their copy code from them. See the main office for help.

10.3. Purchasing Supplies

University Stores

Laboratory Supplies can be obtained from Fischer Stores located in LILY. You must obtain a valid account number from your major professor and present the account number at the store.

Requisitions

Most supplies and equipment should be ordered by regular requisition. After equipment and supply needs are approved by the major professor, the student should complete the purchase requisition form and submit them to Ag Purchasing at agpurchasing@purdue.edu along with the professor's approval.

Students can check out the departmental credit card for purchases from local vendors from the Business Office with the approval of their major professor.

Please contact the Business Office with any questions concerning purchasing.

11. Beyond Research: Taking Advantage of Life at Purdue

Purdue University, as one of the world's great universities, provides valuable opportunities for learning beyond the classroom, laboratory, and field research sites. While you have many responsibilities to fulfill as an ABE graduate student researcher, you are also encouraged to take advantage of the unique resources to which you have access while you are a student here.

- **Getting to know other ABE graduate students** is a great benefit of being at Purdue. The ABE Graduate Student Association (<https://engineering.purdue.edu/abegsa/>) works to foster a sense of community among ABE graduate students through organized social activities, philanthropy events, mentoring, and professional development programs, and all graduate students are encouraged to participate. Purdue ABE graduate students come from around the world, and being part of such an international community is an opportunity to get to know and celebrate our diverse cultures that you are unlikely to have again in the future.
- **Extracurricular:** ABE graduate students are active in many extracurricular activities, including organized athletics, classes at the co-rec, activities at the LGBTQ center, religious activities, and cultural organizations of many nations and cultures. Purdue's cultural centers are listed at <https://www.purdue.edu/diversity-inclusion/about-us/departments.html>, and clubs representing many interests can be found at <https://boilerlink.purdue.edu/>. These activities can provide balance and enrichment in your life while serving others, and graduate students are encouraged to get involved.
- **Graduate Women in Engineering** organizes networking and professional development events. <https://www.purdue.edu/wiep/CurrentStudents/GraduateWomenInEngineering/Join-GWEN.html>
- **Personal development:** Purdue offers courses in a wide variety of topics, and registration for additional courses (up to 18 credits in the fall and spring, and up to 9 credits in the summer) does not increase your tuition. Talk with your major professor about taking additional courses to meet your professional and personal development

goals; in most cases if you keep up with your research and plan of study it will be welcome. These courses will not count towards your degree requirements. You can also audit courses if you receive permission from the instructor and register as an auditor with the appropriate form required by the Registrar's Office.

- **Health and Wellness:** Purdue provides a variety of health and wellness programs including general wellness, nutrition services, massage therapy, and more. For more information please visit <https://www.purdue.edu/recwell/programs/wellnessPrograms/>.

The Graduate School provides links to many other opportunities at <https://www.purdue.edu/gradschool/student/services/>.

Appendices

Appendix A: Plan of Study Worksheet (See Section 3 of ABE Grad Manual for details)

Agricultural & Biological Engineering

NOTE: NOTE: This form is to help plan degree progress. Students must enter their Plan of Study in the Graduate School database found by logging into myPurdue, under the Academics Tab, Graduate School link.

Current Program of Study

Current Degree Program (courses listed below will be included in your electronic Plan of Study, or ePOS)

- ☐ MS
☐ PhD with prior MS
☐ PhD (no MS)

Primary: Mathematics, Statistics, or Data Science

(Math, Stat or Data Science – minimum 3 credits for MS, 6 credits for PhD without MS)

COURSES				Campus where completed	Grade	Date Completed
Official Title (Abbreviated)	Subject	Course #	Credit Hours			

Total Credit Hours: _____

Primary: Area of Specialization Core Courses

(Minimum 6 credits for MS, 12 credits for PhD without MS)

COURSES				Campus where completed	Grade	Date Completed
Official Title (Abbreviated)	Subject	Course #	Credit Hours			

Total Credit Hours: _____

Secondary: Other Related Areas

COURSES				Campus where completed	Grade	Date Completed
Official Title (Abbreviated)	Subject	Course #	Credit Hours			

Total Credit Hours: _____

Minimum Course Credits: 21 (MS or PhD with prior MS) or 42 (PhD without MS)

ABE 69400 MS/PhD Beginner Seminar (Fall): _____

ABE 69600 MS/PhD Research Seminar (Spring): _____

ABE 69700 PhD Professional Seminar (Spring): _____

Prior Graduate Degree

(Complete only if you have already earned a graduate degree from Purdue or another university.)

Prior Graduate Degree:

☐ MS ☐ ME ☐ Other _____	Degree-granting University: _____ (Purdue, etc.)	Date Awarded: _____
	Department or School: _____ (ABE, ASM, ME, CHE, etc.)	

(Math, Stat or Data Science – 3 credits for PhD with previous MS)

[illegible]

Total Credit Hours: _____

(Minimum 6 credits for PhD with previous MS)

[illegible]

Total Credit Hours: _____

Secondary: Other Related Areas

COURSES				Campus where completed	Grade	Date Completed
Official Title (Abbreviated)	Subject	Course #	Credit Hours			

Total Credit Hours:_____

Credit Hours to Waive (≤ 21)

Minimum Course Credits: 21 (PhD with prior MS) or 42 (PhD without MS)

ABE 69400 MS/PhD Beginner Seminar (Fall): _____

ABE 69600 MS/PhD Research Seminar (Spring): _____

ABE 69700 PhD Professional Seminar (Spring): _____

Appendix B: Core Courses for Concentrations

Core courses in Biotechnology Innovation and Regulatory Science, Fluid Power, and Ecological Sciences and Engineering are approved, structured requirements for degree completion. Other Areas of Interest do not currently have structured course requirements outside of those required by the general ABE guidelines described in section 3.1 of this manual. As always, please follow the guidance of your major professor when choosing your courses.

Biotechnology Innovation and Regulatory Science

Core Courses:

ABE 51100	Drug Development (3 cr.)
ABE 51200	Good Regulatory Practices (3 cr.)

A minimum of 2 from the following:

ABE 51300	Quality Management, Audits, and Inspections
ABE 51400	Documents and Dialogues of Drug Development and Registration
ABE 51500	Molecular Basis in Manufacturing
ABE 51600	Medical Devices and Diagnostics

Departmental Requirements:

- Total of 30 credits for the master's degree.
- For thesis master's students, at least 9 credits of ABE 69800 – Master's Research must be part of the 30 total credits. The remaining course credits (9 credits) should be decided with guidance from Professor Clase.
- For non-thesis master's students 3 credits will be from ABE 59100 – Foundations of Research in BIRS. An additional 15 credits of coursework should be agreed upon with guidance from Dr. Clase.
- For both the thesis and non-thesis options, the Math/Stat/Data Science requirement may be met through an approved set of courses that together provide statistical skills and knowledge equivalent to a 3-credit course in statistics.

Ecological Sciences and Engineering

Core Courses

All ESE students must take:

- A minimum of 3 credits of the ESE Seminar.
- Recommended for all students but required of all Non-thesis MS only: 2-credit integrating Maymester course or Summer Internship experience

All students must take during their degree program or have taken in their previous degree program the following courses:

- Biology 59500 (Ecology) 3 credits
- One course (3 credits) in the area of Environmental Policy, Economics, Human Dimensions, and/or Institutional Analysis
- GRAD 612 (Responsible Conduct in Research) 1 credit or comparable course
- One course each from two of the four of the following ESE cores:
 - Life Cycle Thinking/Sustainable Design Core
 - Biogeochemistry
 - Hydrological Sciences
 - Ecosystem Analysis Tools

An updated listing of courses for each core area is available in an Excel file on the [ESE web site](#).

At least one professional development activity is also required.

Fluid Power

Core Courses

Group A – Fluid Power Theories and Applications

ABE 43500	Hydraulic Control Systems for Mobile Equipment
ABE 59100 / ME 59700	Design of Fluid Power System
ABE 69100	Hydraulic Power Trains and Hybrid Systems

Group B – Supporting Topics

ABE 54500	Design of Off-Highway Vehicles
ME 55600	Lubrication, Friction, & Wear
ME 57500	Theory and Design of Control Systems
ME 58500	Instrumentation for Engineering Measurements

The courses in **Group A** cover fluid power theories and applications. Courses in **Group B** are important to the design, modeling, optimization, and control of fluid power systems.

At least half of a student's Fluid Power Core ("Area of Specialization Core Courses" on the Plan of Study) must be drawn from Group A.

Appendix C: Course Recommendations for Areas of Interest

These lists are meant to be a starting point for students to help generate ideas for course registration. They are not inclusive of all courses that are offered or acceptable, but a general list of courses that are often recommended by faculty in a given Area.

When creating a plan of study and registering for coursework, students are expected to work with their major professor to ensure all degree requirements and research expectations are met.

Agricultural Engineering: Digital Agriculture/Mechatronics and Sensors/Engineering Design

ABE 46000 - Sensors and Process Control
 ABE 54500 – Design of Off-road Vehicles
 ABE 59100 – Plant Phenotyping Technologies
 ABE 65100 – Environmental Informatics
 AGR 59500 – Data Management at the Bench
 AGRY 54500 – Remote Sensing of Land Resources
 ASM 54000 – Geographic Information System Application
 ECE 56800 – Embedded Systems
 ME 57000 - Machine Design
 ME 58600 - Microprocessors in Electromechanical Systems (Design optimization)
 ME 58800 - Mechatronics – Integrated Design of Electro-Mechanical Systems

Math/Stat/Data Science

MA 51000 – Vector Calculus
 MA 51400 - Numerical Analysis
 STAT 51100 – Statistical Methods
 STAT 51200 – Applied Regression Analysis
 STAT 51400 - Design of Experiments
 STAT 52400 - Applied Multivariate Analysis
 CE 614 – Statistical and Econometric Methods I

Potential Courses – discuss with advisor

ABE 52700 - Computer Models in ENRE
 ABE 53100 - Instrumentation and Data Acquisition
 AGRY 54500 - Remote Sensing of Land Resources
 ASM 54000 – Geographic Information System Application

Agricultural Engineering: Fluid Power

ABE 59100 - Design & Modeling of Fluid Power Systems
 ME 50600 - Multiphase Flows
 ME 55600 - Lubrication, Friction, and Wear
 ME 57000 - Machine Design
 ME 58600 - Microprocessors in Electromechanical Systems (Design optimization)

ME 58800 - Mechatronics – Integrated Design of Electro-Mechanical Systems

ME 61400 - Computational Fluid Dynamics

Math/Stat/Data Science

MA 51000 – Vector Calculus

MA 51400 - Numerical Analysis

STAT 51100 – Statistical Methods

STAT 51400 - Design of Experiments

STAT 52400 - Applied Multivariate Analysis

CE 614 – Statistical and Econometric Methods I

Potential Courses – discuss with advisor

ABE 52700 - Computer Models in ENRE

ABE 53100 - Instrumentation and Data Acquisition

AGRY 54500 - Remote Sensing of Land Resources

ASM 54000 – Geographic Information System Application

Agricultural Systems Management

AGEC 42400 - Financial Management of Agricultural Business

AGEC 52800 - Global Change and the Challenge of Sustainably Feeding a Growing Planet

AGEC 55200 - Introduction to Mathematical Programming

ASM 53000 – Power and Machinery Management

ASM 55000 – Grain Drying and Storage

ASM 51000 – AgroSecurity

CNIT 51100 – Foundation of Homeland Security

CNIT-51200 – Applications of Homeland Security

Math/Stat/Data Science

STAT 51100 - Statistical Methods

STAT 51200 – Applied Regression Analysis

(If pre-reqs for Stat 51100 and 51200 have not been met, then STAT 50100 and STAT 50200 are recommended.)

CE 614 – Statistical and Econometric Methods I

*All courses listed are suggestions. Please discuss with your Major Professor before registering for coursework.

Biological and Food Process Engineering

ABE 58000 - Process Engineering of Renewable Resources

ABE 591/ME 597 – Characterization of Particles, Powders, and Compacts

ABE 62600 – Life of a Faculty Entrepreneur

ABE 62700 – Colloidal Phenomena

BCHM 56100 – General Biochemistry I

BCHM 56200 – General Biochemistry II

CHE 52500 – Metabolic Engineering
 CHE 54000 – Transport Phenomena
 CHE 55000 – Optimization in Chemical Engineering
 CHE 55500 - Computer Integrated Process Operations
 CHE 55800 - Rate-Controlled Separation Processes
 CHE 62000 – Advanced Transport Phenomena I
 CHE 63000 - Applied Mathematics for Chemical Engineers
 CHE 68500 – Educational Methods in Engineering
 FS 55001 – Food Chemistry
 FS 55301 – Food Microbiology
 FS 61000 – Food Proteins
 FS 63000 – Carbohydrates
 FS 64000 – Aseptic Processing Technologies
 ME 58100 – Numerical Methods in Mechanical Engineering

Math/Stat/Data Science

STAT 51100 – Statistical Methods
 STAT 51200 – Applied Regression Analysis
 STAT 51300 – Statistical Quality Control
 STAT 51400 - Design of Experiments
 CE 614 – Statistical and Econometric Methods I

Biological Engineering and Technology

Permanent Courses (courses offered regularly):

ABE 54000 - Principles of Systems & Synthetic Biology
 ABE 56000 - Biosensors: Application and Fundamentals
 ABE 58000 - Process Engineering of Renewal Resources
 ABE 62700 - Colloidal Phenomena in Bioprocessing
 AGRY 59800/60000 - Genomics
 AGRY 64900 - Molecular Microbial Ecology
 ANSC 55600 - Stem Cell Biology
 BCHM 56100 - General Biochemistry I
 BCHM 56200 - General Biochemistry II
 BCHM 61200 - Bioinformatic Analysis of Genome Scale Data
 BCHM 62000 - Protein Mass Spectrometry & Proteomics
 BIOL 51600 - Molecular Biology of Cancer
 BIOL 52500 - Principles of Neurobiology
 BIOL 52900 - Bacterial Physiology
 BIOL 54100 - Molecular Genetics of Bacteria
 BIOL 60000 - Bioenergetics
 BMS 52400 - Introduction to Confocal Microscopy and Image Analysis
 CHE 52500 - Biochemical Engineering
 CHM 53800 - Molecular Biotechnology
 CHM 62000 - Spectrochemical Instrumentation

Math/Stat/Data Science

CE 614 – Statistical and Econometric Methods I

Temporary Courses (courses not always offered):

ABE 5900 - Transport Phenomena in Food and Bioprocess Engineering
(only offered by arrangement with faculty)

ABE 59100/EEE 59500 - Bioproducts Engineering

ABE 69100/BME 69500 - Quantitative Systems Biology

ANSC 59500 - Molecular Microbiome Analysis

BIOL 59500 - Methods and Measurements in Physical Biochemistry

BME 59500 - Problems in Measurement of Physiological Events

CHE 69700 - Metabolic Engineering

CS 59000 - Computing for Life Sciences

FS 59100 - Microbial Genomes & Metabolism

*One Credit “Hands on” courses relating to Analytical or Biomolecular Techniques (HPLC; GC-MS; Genetics, Bioinformatics, etc.) will be counted upon petition to, and approval of, the course contents by the Graduate Committee with the consent of the advisor.

Biotechnology Innovation & Regulatory Science

ABE 51100 Drug Development

ABE 51200 Good Regulatory Practice

ABE 51300 Quality Management, Audits & Inspections

ABE 51400 Documents and Dialogues of Drug Development & Registration

ABE 51500 Molecular Basis in Manufacturing

Math/Stat/Data Science

Statistics requirement may be met through an approved set of courses that together provide statistical skills and knowledge equivalent to a 3-credit course in statistics.

Environmental & Natural Resources Engineering

ABE 52700 – Computer Models in Environmental and Natural Resources Engineering

ABE 52900 - Nonpoint Source Pollution Engineering

ABE 59100 – Ecosystems Restoration Engineering

ABE 65100 - Environmental Informatics

AGEC 52500 - Environmental Policy Analysis

AGRY 54000 - Soil Chemistry

AGRY 54500 – Remote Sensing of Land Resources

AGRY 56000 – Soil Physics

AGRY 56500 – Soils and Landscapes

AGRY 58000/ABE 59100 – Soil Microbiology
AGRY 64900 – Molecular Microbial Ecology
ASM 54000 – Geographic Information System Application
CE 54000 – Open Channel Hydraulics
CE 54200 - Hydrology
CE 54400 – Subsurface Hydrology
CE 54500 – Sediment Transport Engineering
CE 54900 - Computational Watershed Hydrology
FNR – Remote Sensing Analysis and Applications

Math/Stat/Data Science

BIOL 58210 – Ecological Statistics
AGRY 64100 - Statistical Hydrology
CE 614 – Statistical and Econometric Methods I

Environmental & Natural Resources Engineering: Air Quality

CE 45200 - Air Pollution
CE 45700 - Air Pollution Control and Design
CE 55700 - Air Quality Management

Math/Stat/Data Science

CE 614 – Statistical and Econometric Methods I

Appendix D: Mathematics/Statistics/Data Science Courses

All Mathematics, Statistics and Computer Science courses meet the ABE requirement. The following have been suggested by faculty and students as helpful to some ABE students:

MA 51000 - Vector Calculus
 MA 51100 – Linear Algebra Applied
 MA 51400 – Numerical Analysis
 MA 52700 – Advanced Math for Engineers and Physicists I
 ME 58100 – Numerical Methods in Mechanical Engineering
 STAT 50300 – Statistical Methods in Biology
 STAT 51100 – Statistical Methods
 STAT 51200 – Applied Regression Analysis
 STAT 51300 – Statistical Quality Control
 STAT 51400 – Design of Experiments
 STAT 52400 – Applied Multivariate Analysis

The following courses from other departments have been determined to meet the criteria.

AGRY 64100 – Statistical Hydrology
 BCHM 61200 – Bioinformatic Analysis of Genome Scale Data
 BIOL 58210 – Ecological Statistics
 CHE 63000 – Applied Mathematics for Chemical Engineers
 CS 57800 – Statistical Machine Learning
 CE 614 – Statistical and Econometric Methods I

Data Science courses, including the following, meet the criteria:

(<https://www.science.purdue.edu/data-science/academics/online-modules.html>)

CS 59000 DEI: Data Engineering I
 CS 59000 DEII: Data Engineering II
 CS 59000 FCS: Foundations of Computer Science
 CS 59000 FDM: Foundations of Decision Making
 CS 59000 NCDS: Numerical Computing for Data Science
 MA 598000: Linear Algebra for Data Science
 STAT 59800PS: Probability and Statistics

Note: PHIL 29300DL: Ethics for Data Science is recommended, as it addresses an important Data Science foundation, but as a 200-level course it may not be included on a Graduate Plan of Study.

Not Allowable:

Special Topics courses e.g. COM 68200 - Seminar: Special Topics in Quantitative Research
 Courses that do not involve quantitative analysis

Appendix E: ABE Syllabus for Research Credits

AGRICULTURAL AND BIOLOGICAL ENGINEERING

Graduate Student

RESEARCH REGISTRATION FORM

PUID Term Fall Year 2022NAME
LAST FIRST MI

RESEARCH COURSE INFORMATION					
Add Drop Modify	CRN	SUBJECT	COURSE #	Credit Hours	Course Name
A		ABE or ASM			MS or PHD RESEARCH
A		CAND		0	Enter the appropriate CAND course - 991, 992, or 993 if you expect to graduate at the end of the term. Contact Nikki with questions.

RESEARCH EXPECTATIONS
Enrollment in ABE 698/699 entails an expectation of reasonable progress in scholarly research. These expectations include: i) conducting independent research on the background, motivation, and prior work related to the primary subject of the research project, ii) actively participating in research at a level consistent with a professional research position, iii) contributing to overall operations, iv) following all safety guidelines and expectations associated with the research environment, v) following ethical research practices, vi) contributing to the written and oral dissemination of research findings, and vii) meeting the documented expectations of the thesis advisor. By signing up for research credits, the student acknowledges agreement with the expectations set forth by the faculty member. By allowing the student to sign up for research credits, the faculty member acknowledges that if the student's progress is acceptable with regard to expectations articulated for the semester, the student will receive a satisfactory grade for the course. If additional conditions need to be met, please use the box below to note them.

Appendix F: Forms and Rubrics for Graduate Outcome Assessment

PhD Dissertation and Defense Rubric

Student Name: _____

Major Professor(s): _____

Committee Member Name (please print): _____

Signed: _____ Date: _____

Thesis Document	Does not meet expectations	Meets Expectations	Exceeds Expectations
Quality of Science/Engineering			
Clearly define the research problem and the motivation for research			
Demonstrate understanding of subject matter and associated literature			
Develop and describe appropriate research methods/tools			
Analyze and interpret results/data effectively			
Demonstrate theoretical or applied significance			
Demonstrate critical thinking skills			
Quality of Writing			
Demonstrate adequate writing			
Use logical organization			
Overall Assessment			

Thesis Defense	Does not meet	Meets	Exceeds
Overall Quality of Presentation			
Clearly organize and present the material			
Demonstrate communication skills			
Overall Breadth of Knowledge			
Demonstrate depth of knowledge in subject matter			
Demonstrate critical thinking skills			
Quality of Responses to Questions (complete, well presented)			
Overall Assessment			

PhD Dissertation Research Proposal, Written Prelim, and Oral Prelim Rubric

Student Name: _____

Major Professor(s): _____

Committee Member Name (please print): _____

Signed: _____

Date: _____

Research Proposal

	Does not meet expectations	Meets Expectations	Exceeds Expectations
Overall Quality of Science			
Clearly define the research problem and the motivation for research			
Demonstrate understanding of subject matter and associated literature			
Develop and describe appropriate research methods			
Demonstrate critical thinking skills			
Contribution to the Discipline			
Potential for discovery			
Demonstrate theoretical or applied significance			
Quality of Writing			
Demonstrate adequate writing			
Use logical organization			
Overall Assessment			

Written Preliminary Exam

Overall Quality of Responses			
Quality of response to written exam questions			
Demonstrate critical thinking skills			
Exhibit understanding of subject matter, theoretical concepts, and pertinent literature			
Quality of Communication Skills			
Demonstrate adequate writing			
Use logical organization			
Overall Assessment			

Oral Preliminary Exam

Overall Quality of Responses			
Quality of response to oral exam questions			
Demonstrate critical thinking skills			
Exhibit understanding of subject matter, theoretical concepts, and pertinent literature			
Quality of Communication Skills			
Demonstrate communication skills			
Overall Assessment			

Direct to Ph.D. Quals Evaluation Rubric

Student Name: _____

Major Professor(s): _____

Committee Member Name (please print): _____

Signed: _____

Date: _____

Written Quals Research Report	Does not meet expectations	Meets Expectations	Exceeds Expectations
Quality of Science/Engineering			
Clearly define the research problem and the motivation for research			
Demonstrate understanding of subject matter and associated literature			
Develop and describe appropriate research methods/tools			
Analyze and interpret results/data effectively			
Demonstrate theoretical or applied significance			
Demonstrate critical thinking skills			
Quality of Writing			
Demonstrate adequate writing			
Use logical organization			
Overall Assessment			

Oral Quals Examination	Does not meet	Meets	Exceeds
Overall Quality of Presentation			
Clearly organize and present the material			
Demonstrate communication skills			
Overall Breadth of Knowledge			
Demonstrate depth of knowledge in subject matter			
Demonstrate critical thinking skills			
Quality of Responses to Questions (complete, well presented)			
Overall Assessment			

EXAM OUTCOME

- 1 ☐ **Pass:** Student continues to PhD
- 2 ☐ **Retake:** Student retakes QUALS to correct indicated deficiencies
- 3 A ☐ **MS Required for PhD:** MS research thesis and evaluation for PhD
- B ☐ **Non-thesis MS:** Graduates with non-thesis MS after meeting associated requirements

MSABE or MS Thesis Defense Rubric

Student Name: _____

Major Professor(s): _____

Committee Member Name (please print): _____

Signed: _____

Date: _____

Thesis Document	Does not meet expectations	Meets Expectations	Exceeds Expectations
Quality of Science/Engineering			
Clearly define the research problem and the motivation for research			
Demonstrate understanding of subject matter and associated literature			
Develop and describe appropriate research methods/tools			
Analyze and interpret results/data effectively			
Demonstrate theoretical or applied significance			
Demonstrate critical thinking skills			
Quality of Writing			
Demonstrate adequate writing			
Use logical organization			
Overall Assessment			

Thesis Defense	Does not meet	Meets	Exceeds
Overall Quality of Presentation			
Clearly organize and present the material			
Demonstrate communication skills			
Overall Breadth of Knowledge			
Demonstrate depth of knowledge in subject matter			
Demonstrate critical thinking skills			
Quality of Responses to Questions (complete, well presented)			
Overall Assessment			

Do you recommend the student continues for a Ph.D., should they choose? (Y/N) _____

Appendix G: ABE/ASM 59000 Special Topics Contract Instructions

The ABE/ASM 59000 contract is completed by the student, and constitutes an agreement between an advisor and a student/group of students for individual/small group study of a special problem in a selected area. ABE/ASM 59000 is used for independent study equivalent to an academic course, and should not be used for research projects. The 590 contract must be submitted to the ABE Graduate Program Administrator at least one week prior to the first day of classes of the semester in which the course is to appear. The contract is then sent to the Chair of the Graduate Committee for approval, which must be secured **prior to registration**. Approved copies will be distributed to the Academic Advisor and the 59000 Instructor.

If you are looking to complete an internship with credit connected to professional studies, the 59000 contract can be used to register for course credits.

INTERNATIONAL STUDENTS!!!

If you are registering for CPT (practical training that takes place during your studies) or OPT (practical training that occurs after your studies end) **DO NOT USE THIS FORM**. Contact Nikki at nzimmerm@purdue.edu.

Instructions:

1. Meet with your Major Professor or the instructor for the 590 course and fill out the items required.
2. Send the form to the Graduate Program Administrator, requesting that you be registered for the course. Copy your Major Professor or the course instructor who will need to email their approval.
3. Nikki will have the form reviewed for approval by the Graduate Committee representative. They will work with the faculty to edit the form and approve.
4. Once these approvals are in place, the student will input the necessary information to have the course created in their myPurdue:

How to request a VT form

https://www.youtube.com/watch?v=TL_P6UQuWdg

Confirmed Creation of VT request

https://www.youtube.com/watch?v=aJSZol_fDio

Agricultural and Biological Engineering Department
ABE 59000 or ASM 59000 – Special Problems

If you are creating a 59000 to receive credit for taking a GEAPS (Grain Elevator and Processing Society) course, please use the ABE/ASM 59000 GEAPS form, not the form below.

This is a contract between an advisor and a student/group of students for individual/small group study of a special problem in a selected area. ABE/ASM 59000 is for independent study equivalent to an academic course and should not be used for research projects. This form must be submitted to the ABE graduate committee at least one month prior to the first day of classes of the semester in which the course is to appear. Graduate committee approval must be secured **prior to registration**. Approved copies will be distributed to the Academic Advisor and the 59000 Instructor.

Name: _____ Student I.D. No. _____

ABE/ASM 59000 Instructor: _____ Academic Advisor: _____

Course Substitute Sought (if any): _____

Semester and year to be taken (e.g., Spring 2011): _____

Student's Anticipated Classification Next Semester: _____

Subject ¹	Number	Credit Hours	Grade Opt	← Enter subject (ABE or ASM), credit hours and “P” if pass/not pass ↓ Enter course problem title in spaces below (30 chars. max.) –be specific, descriptive																									
	59000																												

[Delete the text in brackets - it is included to aid in completing the form.]

Justification:

[Why this course needs to be a Special Problems course]

¹ Choose ABE **OR** ASM.

Statement of Topic(s) To Be Studied:**Required Readings:****Learning Objectives:**

[Clarify what the student will learn in this independent study course. These should not be written as research objectives. Learning objectives are often in the following form:

Learn to

Be able to....]

Procedure:

[Describe what the student will do to achieve the learning objectives. The procedure may include readings, assignments, meetings with the Advisor or other faculty, completion of online modules, reports, etc.]

Basis for Grading:

Report Due Date: _____

Student Time Commitment	Number of Hours	Days and Time of Conferences
Student-Instructor Conferences		
Independent Reading		
Analysis or Lab Work		
Final Report Preparation		
Other:		
Semester Total Hours (approx. 40-45 hrs/cr)		

Appendix H: Timeline for MS Students

(This timeline usually begins in a fall semester.)

Before Semester 1	- Communicate with your Major Professor. - Arrive to campus at least one week before semester starts- speak with your Major Professor to agree on date. - Attend ABE Graduate Student Orientation and the Graduate School's Orientation during week before classes. - Meet with Major Professor to plan first semester courses. Register for courses, ABE 69400, and research credits (fall and spring semesters, register for 15 total credits in each semester, 9 in the summer) - Complete syllabus form (found in Appendix C) to register for research credits (often 6 credits)
Semester 1	- Satisfy admissions conditions (submit official transcripts, etc.) per the Graduate School. - Develop Plan of Study, based on discussions with Major Professor and your interests. Include a draft Committee, which can be changed later if needed. - Take courses and research credits including ABE 69400. - Before the end of the semester, register for the following semester including research credits
Semesters 2-3 (up until the final semester)	- Meet with your Committee to discuss courses, research, and progress each semester. - Take courses and research credits - complete syllabus form for each semester of research credit registration. - Take ABE 696 Seminar in a Spring semester before completing an MS degree. - Before the end of the semester, register for the next semester including research credits
Before Final Semester	- Register as CAND 991, 992, or 993 for the semester you plan to graduate (See Section 6.1 of the ABE Graduate Student Manual for details) - Plan process for final exam with Advisor and Committee - Ensure that your Plan of Study is complete, courses in your Plan are correct, and all degree requirements are met, including ABE 694 and 696
Final Semester	- Schedule Defense date with Major Professor and Committee. The Defense date must be at least 2 weeks before the end of the semester (see Graduate School Calendar) but usually prior to that to make time for updates. - Schedule a room for your Defense with the Main Office
At least 2 weeks before Defense	- Initiate Form 8 "Request for Appointment of Examining Committee" with the Grad School through MyPurdue Graduate School link - Send Thesis to all Committee members, following the Graduate School's required format - Prepare Defense Announcement using ABE template provided by Grad Admin, template can also be found on ABE website. Graduate Program Admin will announce date and time by email.
Day before Defense	Prepare and print Rubric Forms for each Committee member from ABE Grad Admin or from website (Also in Appendix D)
Day of Defense	Present and defend your thesis
When Thesis completed	- Complete electronic Thesis Acceptance Form (ETAF). Discuss with your advisor questions about Delay of Publication and Confidentiality. - Once approved, you will be able to log into to your Plan of Study portal and find the link to submit your thesis to HammerRR. - Upload thesis for Graduate School review at least 24 hours before the Deposit Deadline.
After graduation	Keep in touch with your Major Professor and the Grad Program Admin in ABE!

Timeline for Ph.D. Students

(This timeline assumes the student begins in a fall semester.) Before Semester 1	- Communicate with your Major Professor - Arrive to campus at least one week before semester starts - speak with your Major Professor to agree on date - Attend ABE Graduate Student Orientation and the Graduate School's Orientation during week before classes - Meet with Major Professor to plan first semester courses. Register for courses (often 9 credits), ABE 69400 (if not continuing from ABE-MS program), and research credits (fall and spring semesters, register for 15 total credits in each semester, 9 in the summer) - Complete syllabus form (found in Appendix C) to register for research credits (often 6 credits)
Semester 1	- Satisfy admissions conditions (submit official transcripts, etc.) per the Graduate School - Develop Plan of Study, based on discussions with Major Professor and your interests Include a draft Committee, which can be changed later if needed - Take courses and research credits - Before the end of the semester, register for the next semester including research credits
Semesters 2 through the final year	- Take courses and research credits, including ABE 697 in a Fall semester and ABE 696 in a Spring semester (both should be taken either before or during the semester you plan to Prelim) - Complete syllabus form for each semester of research credit registration - Meet with your Committee to discuss research each semester - Before the end of the semester, register for the next semester including research
At least 1 year before you plan to graduate (<i>Must be completed no less than 1 year prior to graduation</i>)	- Meet with Committee to plan Preliminary Examination procedures - Complete Research Proposal and circulate to Committee - Conduct Written Prelim - Schedule Oral Prelim and submit Form 8 at least 2 weeks prior. (See Checklist in Section 5.1 of ABE Graduate Manual for completing the Oral Prelim) - Schedule a room for your Prelim with the Main Office - Initiate Form 8 "Request for Appointment of Examining Committee" with the Grad School through MyPurdue Graduate School link
Before Final Semester	- Register as CAND 991, 992, or 993 for the semester you plan to graduate (See Section 6.1 of ABE Graduate Manual for details) - Plan process for final exam with Major Professor and Committee - Ensure that your Plan of Study is complete, courses correct, and all degree requirements are met, including ABE 696 in a Spring semester (if both MS and Ph.D. completed in ABE, this will be taken twice), and ABE 697 in a Fall semester
Final Semester	- Schedule Defense date with Major Professor and Committee. The Defense date must be at least 2 weeks before the end of the semester (see Graduate School Calendar) but usually prior to that to make time for updates - Schedule a room for your Defense with the Main Office
At least 2 weeks before Defense	- Initiate Form 8 "Request for Appointment of Examining Committee" with the Grad School through MyPurdue Graduate School link - Send Dissertation to all Committee members, following Graduate School's required format - Prepare Defense Announcement using ABE template provided by Grad Admin, template also found on ABE website. Graduate Program Admin will announce date and time by email.
Day before Defense	Prepare and print Rubric Forms for each Committee member from ABE Grad Admin or from ABE website (Also in Appendix D)
Day of Defense	Present and defend your dissertation

When Dissertation completed	• Complete electronic Thesis Acceptance Form (ETAF). Discuss with your advisor questions about Delay of Publication and Confidentiality. • Once it has been approved, you will be able to log into to your Plan of Study portal and find the link to submit your thesis to HammerRR. • Upload dissertation for Graduate School review at least 24 hours before the Deposit Deadline.
After graduation	• Keep in touch with your Major Professor and the Grad Program Admin in ABE!

Appendix I: Thesis/Dissertation Deposit Checklist

THE DEPOSIT PROCESS

[1] COMPLETE ELECTRONIC THESIS ACCEPTANCE FORM [ETAF] AND REQUIRED SURVEY(S)

The ETAF (also called Form 9) is available by logging into your myPurdue and proceeding to the Plan of Study portal. A helpful guide to initiating your ETAF is available here: [Student Instructions for Initiating the Thesis Acceptance Form \(PDF\)](#).

[2] SUBMIT YOUR ETD TO HAMMER RESEARCH REPOSITORY (HammerRR)

Your document must be uploaded at least 24 hours in advance of the Deposit Deadline to allow staff to review your submission.

[3] PAY THE DEPOSIT FEE

Master's Thesis Fee \$90.00
Ph.D. Dissertation Fee \$125.00

For more detailed information and a full checklist, visit:
<https://www.purdue.edu/gradschool/research/thesis/requirements.html>

Appendix J: Important University Offices & Their Duties

University Parking Services

Purdue West Shopping Plaza
1404 W. State Street
West Lafayette, IN 47906

(765) 494-9494

<https://www.purdue.edu/parking/index.html>

- Schedule a tour
- Get a parking permit
- Appeal a parking ticket

Card Services Office

Hovde Hall, room 5

(765) 496-0444

<http://www.purdue.edu/business/card/PurdueIDCardOffice@purdue.edu>

- Get your student identification card
- Add money to your Boiler Express Account

ITaP (Information Technology at Purdue)

Customer Service Center
Stewart Center, Room g-65

(765) 494-4000

<http://www.itap.purdue.edu/help/>

- Ask questions about your student email account
- Get computer support
- Buy discounted computers
- Obtain information about cell phone discounts

PUSH (Purdue University Student Health)

601 Stadium Mall Dr.

(765) 494-1700

www.purdue.edu/push

The Graduate School

Young Hall, room 170

(765) 494-2600

<https://www.purdue.edu/gradschool/>

- Admissions and turn in original documents
 - Fellowship Office
 - Student records
 - Thesis and Dissertation Office
 - Office of Graduate Assistance - Ombudsman services:
- <https://www.purdue.edu/gradschool/student/oga/index.html>

Purdue Fire: (765) 494-6919

Purdue Police: (765) 494-8221

International Students and Scholars (ISS)

Schleman Hall, room 136

(765) 494-5770

<http://www.iss.purdue.edu/>

- Immigration services
- International student Orientation
- Visa questions, issues

Office of the Dean of Students

Schleman Hall, room 207

(765) 494-1747

<http://www.purdue.edu/odos/>

- Find a student organization to join
- Disability Resource Center

Office of the Registrar

Hovde Hall, room 45

(765) 494-6165

<https://www.purdue.edu/registrar/registrar@purdue.edu>

- Course registration issues
- Holds
- Schedule changes
- Audit forms
- Transcripts
- Commencement and diploma questions

Bursar's Office

Hovde Hall, room 5

(765) 494-7570

<http://www.purdue.edu/bursar/askbursar@purdue.edu>

- Pay tuition or fees
- Aid disbursement
- Fee deferment

Division of Financial Aid

Schleman Hall, room 305

(765) 494-5050

<https://www.purdue.edu/dfa/>

- Financial assistance eligibility
- Grants and loans
- Part-time employment

Appendix K: ABE Staff Directory & Duties

Graduate Program Administrator – Nikki Zimmerman, ABE, room 1041 nzimmerm@purdue.edu

- Contact when you need help and/or when you do not know where to start
- Contact when you have questions about anything- departmentally, university-wide, West Lafayette/Lafayette area, or pretty much anything else
- Support – academic, emotional, whatever...
- Plans of Study
- Registration
- Filing prelim, defense, or graduation forms

ABE Business Office – Kathy Best, Josh Resler and Kylie Wagoner, ABE, room 1021

kjbest@purdue.edu jresler@purdue.edu wagonek@purdue.edu

- Concur travel questions
- Filling out travel forms
- Purchasing
- Payroll
- Information regarding student insurance, time off for students on assistantships, etc.

Digital Systems Manager – Stan Harlow, ABE, room 1005B harlow@purdue.edu

- Computer account
- Installing software
- Computer issues
- ProE and AutoCad

Assistant to the Department Head & Academic Coordinator – Dan Taylor, ABE, room 1033

taylordc@purdue.edu

- Nikki's backup
- Recruiting
- Anything that needs departmental action – start with Dan

Administrative Assistant to the Department Head – Becky Peer, ABE, room 1005D

peerb@purdue.edu

- Things related to Dr. Mosier
- Desk assignment and Keys
- Room scheduling
- Reserve departmental vehicles for driving off-campus (pre-registration required)
- Mail questions

Lab Managers – Logan Heusinger and Amanda Limiac, ABE, room 2087Alheusing@purdue.edumontgom8@purdue.edu

- Safety training
- If you TA an undergraduate course with a lab, they can help.
- Lab equipment and space questions

Alumni Relations and Communications – Carol Weaver, ABE, room 1005Acmweaver@purdue.edu

- Poster printing
- Items for ABeNotes
- Website Information
- Social Media items

Shop Manager & Building Deputy – Scott Brand, ABE, room 1005C brand@purdue.edu

- Building issues
- Safety training
- Fabrication of equipment for research
- Vehicles

ABE Undergraduate Program – Brenda Schroeder, ABE room 1035, Laurie Snyder, room 1037, & Yvonne Hardebeck, room 1044brendaschroeder@purdue.edusnyde158@purdue.eduhardebey@purdue.edu

- Registration and other questions when Nikki is unavailable
- Scheduling questions when Nikki is unavailable