



Biological Systems Engineering

UNIVERSITY OF WISCONSIN-MADISON

Graduate Student Handbook

Last Revision: Summer 2015



Agricultural Engineering Building 460 Henry Mall

Table of Contents

Introduction	Page 3
Graduate Faculty	Page 4
BSE Graduate Student Coursework Planner	Page 5
Policies Regarding Graduate Study	Page 6
Requirements for the Master's Degree	Page 11
Requirements for the Ph.D. Degree	Page 13
General BSE Departmental Policies	Page 22
Graduate Student Certification Form	Page 30
Graduate School Degree & Dissertator Deadlines 2014-2015	Page 32
Master's Degree Warrant Request Form	Page 34
Preliminary Warrant Form	Page 35
Ph.D. Final Oral Committee Approval Form	Page 36
Sample Title Page	Page 37
Committee Page	Page 38
Graduate Committee Composition	Page 39
Summer Enrollment Requirements	Page 40
Option A Minor Approval Form	Page 41

Prepared by
The Graduate Instruction and Research Committee
Department of Biological Systems Engineering
University of Wisconsin-Madison

1. INTRODUCTION

Graduate students in Biological Systems Engineering Department (BSE) strive to better understand the current theories, principles, and issues in wide-ranging biologically related fields. The students focus on better understanding how research helps generate new knowledge and how knowledge is applied to address both practical and fundamental problems. Through this process, graduate students improve their ability to think critically and creatively, to synthesize, analyze, and integrate ideas for decision-making and problem solving.

The graduate program in BSE is "tailor-made" to meet the specific needs and interests of a student and his/her major professor. A graduate student has primary responsibility for developing his/her program of study, conducting research, and preparing a thesis. However, the student must maintain close contact with his/her major professors for advice and supervision in all phases of research.

This handbook provides an overview of the requirements and policies for graduate study in the BSE Department at the University of Wisconsin-Madison.



Graduate student summer cookout at Picnic Point

2. GRADUATE FACULTY

2.1 Biological Systems Engineering Faculty

Robert P. Anex	Ph.D. Professor, also Wisconsin Bioenergy Initiative
David R. Bohnhoff	Ph.D. Professor
Christopher Choi	Ph.D. Professor
Sundaram Gunasekaran	Ph.D. Professor, also Food Science, Chair of Graduate Instruction and Research Committee (GIRC)
Awad S. Hanna	Ph.D. Professor, also Civil and Environmental Engineering
David W. Kammel	Ph.D. Professor
K.G. Karthikeyan	Ph.D. Professor
Rebecca A. Larson	Ph.D. Assistant Professor
Brian Luck	Ph.D. Assistant Professor
Richard M. Muck	Ph.D. Professor, USDA-AARS Dairy Forage Research Center
Xuejun Pan	Ph.D. Associate Professor
John Ralph	Ph.D. Professor, Biochemistry
Douglas J. Reinemann	Ph.D. Professor, also Institute for Environmental Studies, Dairy Science and Agroecology, Department Chair
Troy M. Runge	Ph.D. Assistant Professor
Kevin J. Shinnars	Ph.D. Professor, also Mechanical Engineering
John Shutske	Ph.D. Professor, also Associate Dean CALS Extension and Outreach
Richard J. Straub	Ph.D. Professor, also Mechanical Engineering,
Anita M. Thompson	Ph.D. Associate Professor

2.2 Adjunct Faculty

Mark R. Etzel	Ph.D. Professor, Food Science and Chemical and Biological Engineering
Richard W. Hartel	Ph.D. Professor, Food Science
Sam King-Jau Kung	Ph.D. Professor, Soil Science
Philip R. O'Leary	Ph.D. Professor, Engineering Professional Development
Mark A. Purschwitz	Ph.D. Professor, National Farm Medicine Center
Paul D. Thompson	Ph.D. Professor
Vadas, Peter	Ph.D. Professor, Dairy Systems
Zhu, Junyong	Ph.D. Professor, Forest Products Lab

3. POLICIES REGARDING GRADUATE STUDY

3.1 Graduate School Policies and Requirements

All requirements set forth by the UW Graduate School must be met. Every graduate student should review and understand the Graduate School guidelines. Up-to-date information on Graduate School policies and requirements can be found at their website: <http://www.wisc.edu/grad/>.

- Graduate School Catalog
<http://www.grad.wisc.edu/catalog/index.html>
- Academic Policies & Procedures
<http://www.grad.wisc.edu/education/acadpolicy/index.html>
- Completing Your Degree
<http://www.grad.wisc.edu/education/completedegree/index.html>
- Student Life at UW-Madison
<http://grad.wisc.edu/studentlife/>

3.2 Biological Systems Engineering Department General Policies and Requirements

3.2.1 Admission to Graduate Study in Biological Systems Engineering

All pertinent Graduate School requirements must be met. These are listed below.

3.2.1.1 UW Graduate School Admission Requirements

As you apply to the UW, you need to be aware of two sets of requirements: (1) Graduate School minimum admission requirements and (2) departmental admission requirements.

(1) The Graduate School sets the minimum admission requirements for all prospective UW graduate students.

The minimum admission requirements are:

- Academic program admission requirements (see below) may be in addition to, or more rigorous, than the Graduate School requirements.
- Grades – A minimum undergraduate grade-point average (GPA) of 3.00 on the equivalent of the last 60 semester hours (approximately two years of work) **or** a master's degree with a minimum cumulative GPA of 3.00. Applicants from an international institution must have a strong academic performance comparable to a 3.00 for an undergraduate or master's degree. All GPA's are based on a 4.00 scale. We use your institution's grading scale; do not convert your grades to a 4.00 scale.
- Degree - A bachelor's degree from a regionally accredited U.S. institution, or a comparable degree from an international institution.



A Fox chopper being used in a drying study.

- International applicants must have a degree comparable to a regionally accredited U.S. bachelor's degree. Your school should provide an official translation of your documents; otherwise have a translation done by your school or an official translator. In some countries these people are also notaries. Do not submit an evaluation from a credential evaluation service in lieu of a translation.

English Proficiency

- Every applicant whose native language is not English, or whose undergraduate instruction was not in English, must provide an English proficiency test score. Your score is considered too old, and will not be accepted, if it is more than 2 years old from the start of your admission term. Country of citizenship does not exempt applicants from this requirement. Language of instruction at the college or university level, and how recent it has been, are the determining factors in meeting this requirement.
- Applicants are exempt if: English is the exclusive language of instruction at the undergraduate level; **or** they have earned a degree from a regionally accredited U.S. college or university not more than 5 years prior to the anticipated semester of enrollment; **or** they have completed at least two full-time semesters of graded course work, exclusive of ESL courses, in a U.S. college or university, **or** at an institution outside the U.S. where English is the exclusive language of instruction, not more than 5 years prior to the anticipated semester of enrollment.
- An applicant whose TOEFL (paper-based) test score is below 580; (TOEFL internet based iBT) test score below 92; IELTS score below 7; or MELAB below 82 must take an English assessment test upon arrival. Depending on your score you may need to register for any

recommended English as a Second Language (ESL) courses in the first semester you are enrolled.

- International Financial Information - International applicants are required to have adequate financial resources to cover their expenses for the duration of their studies at UW-Madison. <http://www.grad.wisc.edu/education/admissions/financialinfo.html>

(2) The departmental admission requirements are often more rigorous than the minimum requirements set by the Graduate School. However, the department may be flexible on some requirements based on an individual student's background.

(3) BSE Graduate students are required to be enrolled during all three semesters; fall, spring and summer sessions. *Please see page 32 for details on summer enrollment.*

The BSE Department stipulates that all applicants should have a Bachelor of Science degree from an ABET (Accreditation Board for Engineering and Technology) accredited engineering program. Applicants who do not have a Bachelor of Science degree from an ABET accredited engineering program may be eligible for admission if they have completed the following basic engineering course work:

- Thirteen credits of mathematics, (calculus, analytical geometry, and differential equations);
- Six credits in statics, mechanics of materials, material sciences;
- One of the following groups of courses **depending on the area of graduate research:**
 - Machinery systems engineering: dynamic, fluid dynamics, and thermodynamics.
 - Food and bioprocess engineering: fluid dynamics, heat transfer, and thermodynamics.
 - Natural resources and environmental engineering: soil science, fluid mechanics, and soil and water engineering.
 - Structural systems engineering: structural engineering heat transfer, and thermodynamics.
 - Agro-based chemistry and materials: analytical, organic and physical chemistry and basic materials science.

When necessary, course work equivalencies shall be determined by the department's Graduate Instruction and Research Committee (GIRC). The applicant's intended major professor may require an incoming graduate student to take additional course work before admission is granted. Any deficiency course work at time of admission cannot be counted towards degree requirements. Exceptions may be granted by having the students' major professor petition the GIRC.

When the GIRC evaluates each applicant's credentials, special consideration is given to the undergraduate program, letters of recommendation, statement of purpose, and apparent aptitude and ability to perform research. **International students must submit TOEFL scores.** Applicants are strongly encouraged to submit GRE scores which may be used in decisions regarding admission, graduate research assistantships, and college and university fellowships.



Graduate students gather for BSE's annual Thanksgiving Potluck.

3.2 Fellowship and Assistantship Holders

For Graduate School policies concerning support, see the following sections in the [Academic Policies and Procedures](#) : (1) Enrollment Requirements, (2), Maximum Levels of Appointments, (3) Third-Party Deferrals, (4) Tuition Remission, (5) International Students maintaining Legal Status), (6) Appendix 2 (Payroll Benefits).

Research assistantships for Master's degree candidates are limited to 4 semesters plus 2 summer sessions; for Ph.D. candidates, 6 semesters plus 3 summer sessions, generally. In cases where both the Master's and Ph.D. degrees are obtained from the University of Wisconsin (and the student proceeds directly from a B.S. degree into a Ph.D. degree program) research assistantships are limited to a total of 8 semesters plus 4 summer sessions. Exceptions to this policy under extenuating circumstances will be considered upon petition to the GIRC. The student's major professor should initiate the petition.

3.3 Minimum UW-Madison Credit Requirement

The Graduate School's minimum credit requirement for graduation can be satisfied only with graduate-level courses taken as a graduate student at UW-Madison. The only exception may be graduate-level course work taken as a CIC Traveling Scholar.

The minimum credit requirement is a degree requirement instituted by the graduate faculty to ensure that a graduate degree represents preparation beyond course requirements. The minimum credit requirement provides the opportunity for those who earn graduate degrees to spend sufficient time engaged in their discipline (that is, meeting with professors and peers; participating in research projects and colloquia; using laboratories, clinics, and/or libraries; and generally becoming an active contributor to a research discipline).

3.4 Insurance and Medical Benefits

Medical benefits are available for graduate students. See the [Academic Policies and Procedures](#) sections on Insurance and Medical Benefits, University Health Service, and Appendix 2. The Department Payroll and Benefits person (room 115 Agricultural Engineering Building) has additional information regarding information regarding insurance.



Rainfall simulation work being conducted at Arlington
Agricultural Research Station

3.5 Requirements for the Master's Degree

Two options are available for the Master's degree in BSE: a thesis option and a non-thesis option (i.e., an independent study program). If your objective is to pursue a Ph.D. degree and/or research-oriented career, you are strongly encouraged to select the thesis option. Graduate research assistantships are generally not awarded to students pursuing the non-thesis option. Students should select course work in consultation with and approval of the major professor. Total credits required (beyond B.S.) for M.S. degrees in the BSE Department are listed below.

Minimum Requirements	Thesis Option	Non-Thesis Option
Total credits ¹	30	30
Letter-graded UW-Madison course credits ²	18	24
Graduate course credits ³	15	15
Thesis research credits	6	--
Independent study credits	--	3
Graduate seminar credits ⁴	2	2
BSE course credits ⁵	8	8

¹Not including course credits taken to satisfy admission requirements.

²At least 6 cr must be from course work at the 500-level and above science/engineering classes; can include up to 6 cr of science/engineering classes taken at 400-level and above as UW-Madison undergraduate.

³700-level and above classes (including research, independent study, and seminar credits) and 300- to 600-level classes that have graduate course attribute.

⁴typically BSE900 and BSE901

⁵Includes research/independent study and seminar credits

The above requirements will be effective starting Fall 2014. If interested, currently enrolled MS students will be allowed to follow these requirements.

Every candidate should review the requirements for the Master's degree, given in the Graduate School publication; [Academic Policies and Procedures](#), specifically sections on: (1) Adviser, (2) Committees (Doctoral/Master's) (3) Degree Completion Fee, (4) Double Degree, Joint Degrees and Double Degree, (5) Final Oral Examination and Final Oral Examination Committee, (6) GPA Requirement and Grading System, (7) Graduation, (8) Residence for Tuition Purposes, (9) Second Degrees, (10) Senior-Graduate Status, (11) Study Abroad, (12) Summer Enrollment, (13) Time Limits, (14) Transfer of Graduate Work from Other Institutions, and (15) Warrants.



Machinery Systems Students

Both thesis and non-thesis option students should select a committee of three faculty members in consultation with their major professors. (*See pages 39 for committee composition*) For thesis option students, at least one of the committee members should be from another department. All students must present their research results at an oral final examination to the committee.

All BSE graduate students are required to take BSE 900: Graduate Research Seminar" within the first three semesters (*offered fall semester only*).

All BSE graduate students are required and should take "BSE 901: Graduate Research Seminar" within the last two full semesters (*offered spring semester only*) of their graduation

Graduate students should register for an appropriate number of credits of BSE 990 (Thesis Research). If the student's progress is satisfactory, the student will receive a grade of P (progress) for each semester of BSE 990 until the final semester. At that time all of these credits will be given an S (satisfactory) grade by the major professor.

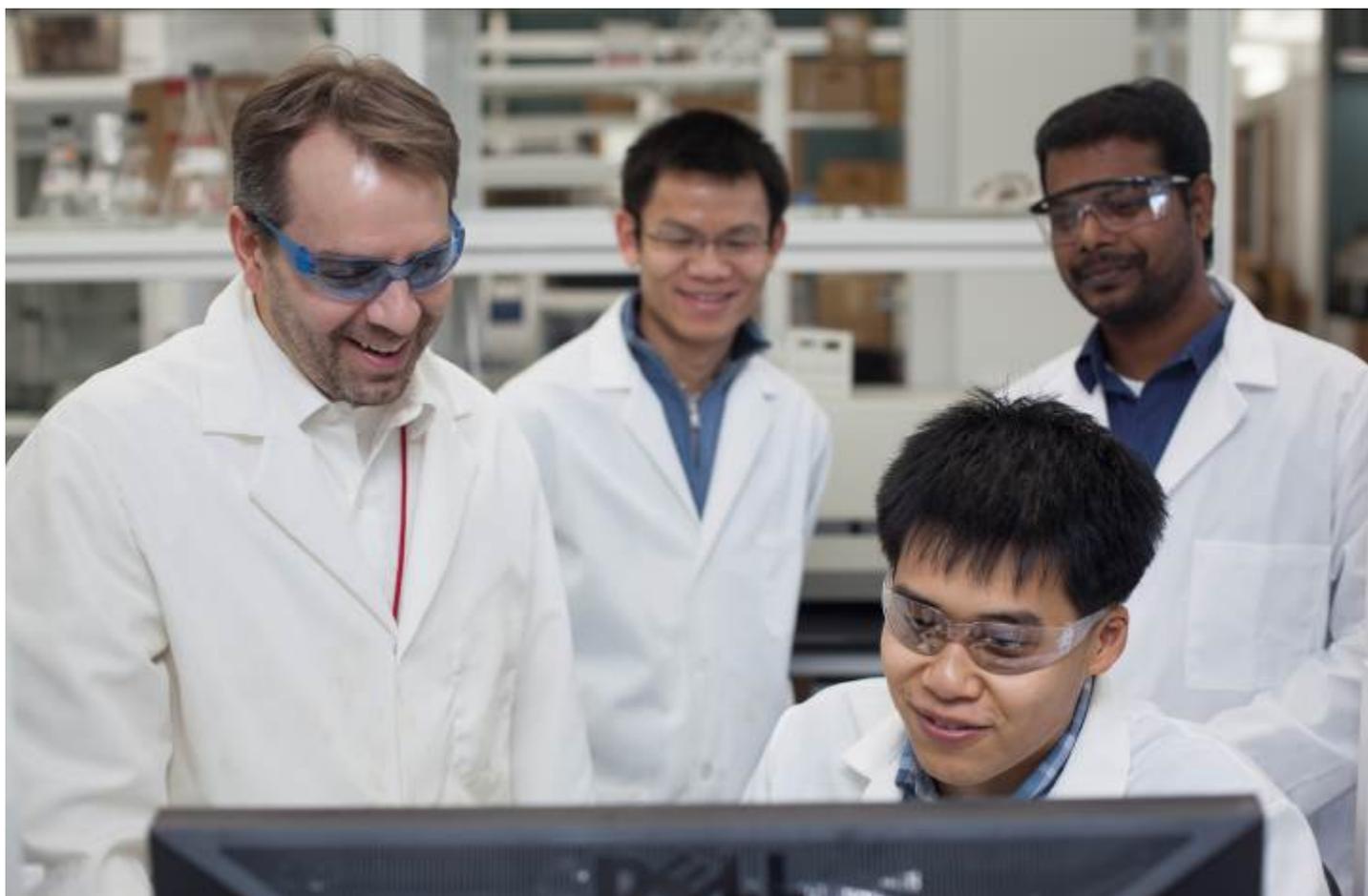
3.6 Certification

All students must complete a graduation checklist and be certified by the GIRC before taking their final oral examination (*Page 30*). A request for a Graduate School Warrant will not be processed until

this checklist has been completed. Questions concerning committee members can be answered by turning to page 39. To receive a master's degree, a student should contact their program office at the beginning of the term in which they intend to graduate. Their program office will check that they have met department/program requirements and will request a warrant from the Graduate School on the student's behalf. Students need to be enrolled for a minimum of two graduate-level credits (300 and above) for a grade (audits and pass/fail do not satisfy this requirement) during the term in which they intend to graduate. For more information and for deadlines, see *Expecting Your Master's Degree? Procedures to Help*: <http://www.grad.wisc.edu/education/completedegree/mdegree.html>.

3.7 Teaching Experience

Students pursuing the M.S. degree who desire teaching experience may assist in the department's teaching program in consultation with his/her major professor. Please see section 3.9.2 for additional guidelines.



Professor Troy Runge in his lab working with Assistant Scientist Sasikumar Elumalai, and Graduate Students; Zhouyang Xiang & Shengfei Zhou.
& graduate students Shengfei Zhou & Zhouyang Xiang

3.8 Requirements for the Ph.D. Degree

3.8.1 UW Graduate School Requirements

Graduate School regulations concerning course work are given in [Academic Policies and Procedures](#) in sections on: (1) Auditing Courses, (2) Continuous Enrollment Requirement, (3) Credit Load, (4) Dissertator (FAQ), (5) Full-Time Status, (6) GPA Requirement, (7) Grading System, (8) Overloads, (9) Transfer of Credits, and (10) Underloads.

All Ph.D. candidates should review the following sections of the [Academic Policies and Procedures](#): (1) Adviser, (2) Certificate of Philosophy, (3) Change of Degree Level, (4) Committees, (5) Continuous Enrollment Requirement, (6) Credit Load, (7) Degree Completion Fee, (8) Dissertation, (9) Dissertator (FAQs), (10) Final Oral Examination, (11) Final Oral Examination Committee, (12) Full-Time Status, (13) GPA Requirement, (14) Grading System, (15) Graduation, (16) Joint Degrees, (17) Major and Minor, (18) Preliminary Examinations, (19) Residence for Tuition Purposes, (20) Second Degrees, (21) Study Abroad, (22) Summer Enrollment, (23) Time limits, (24) Transfer of Graduate Work from Other Institutions, and (25) Warrants.

3.8.2 Biological Systems Engineering Department Requirements

3.8.2.1 Ph.D. after BS without Earning an MS

A graduate student may pursue Ph.D. in the BSE department directly after BS degree without earning an MS degree provided that he/she does the following:

1. Complete course work and research credits required for Ph.D. degree per Graduate School and department guidelines.
2. Pass qualifying examination (oral and/or written) within four full semesters since commencing graduate work.
3. Submit a research manuscript to a peer-review journal prior to preliminary examination.
4. Pass preliminary examination and final defense per Graduate School and department guidelines.



DATA COLLECTION

Visiting PhD student Stefania Leonardi from the University of Milan, Italy, joined the milking lab team (Doug Reinemann and PhD student John Penry from Australia) from February to August 2014. Here she is in action collecting data for a milking machine experiment.

3.8.2.2 Credits

Normally 66-78 credits are required beyond the B.S. degree. Of these, 42 to 54 course credits and 24 thesis credits must be completed. At least 36 of the course credits must be taken in physical sciences. Up to 6 research credits received for the master's degree may be transferred from another accredited institution. No other research credit may be transferred. 18 Master's course credits earned from another institution may be transferred towards Ph.D. Additional credits need to be approved by GIRC. At least 9 credits must be from the 600 to 800 level classes from an engineering department and/or comparable technical area. In addition to the above coursework requirements, 2 credits of graduate seminar as well as 3 credits of teaching preparatory/professional communications class will be required for all Ph.D. students. Some possible courses are EPD 597, EPD 654 or BSE 799; which is a practicum in agricultural engineering teaching. The teaching course credits shall not be used to fulfill 9 credits of 600 to 800 level classes from an engineering department and/or comparable technical area.

Teaching preparatory courses and seminar courses will NOT count towards the required 24 (42) course credits.

All course credits need to be taken as a letter grade unless course is only offered for credit/no credit. Credit/no credit courses must get prior approval from advisor. Only 1 credit/no credit of the 9 credits can be used to fulfill your credits from 600-800 level classes.

3.8.2.3 Course Work

All graduate students are required to register for one credit of BSE 900 (only offered fall semesters) within the first three semesters as a graduate student in BSE. However, if you completed your Master's Degree in BSE you do not have to repeat the 1 credit seminar 900. You are also required to take one credit of BSE 901 (only offered spring semesters), Graduate Research Seminar. As a part of BSE 901, all students (if you took this course as a MS student you will need to repeat the course as a Ph.D. student to reflect your current research) are required to make an oral presentation reporting their research results, typically during the last semester of their graduate program.

Graduate students should register for an appropriate number of credits of BSE 990 (Thesis Research). If the student's progress is satisfactory, the student will receive a grade of P (progress) for each semester of BSE 990 until the final semester. At that time all of these credits will be given an S (satisfactory) grade by the major professor.

Graduate students in BSE must maintain a minimum overall B average (3.0 GPA) during their graduate studies. Seminars, research, or other special problems credits may not be used to offset BC or C grades. No grade below a C will be accepted for fulfilling course work requirements for the degree

Recommended credit loads are as follows.

Percent of time obligated by an assistantship	Recommended maximum course load & residence credits
50 % or less	9 to 12
Between 50 and 67 %	6 to 8
Greater than 67% but less than 100%	3 to 5



Graduate student Josh Accola did field sampling in Qatar as part of his research.

3.8.2.4 Minor

The student may include a minor field(s) of study that is (are) selected in consultation with the major professor. The minor should be chosen from a field that will both diversify and strengthen the student's research program. The plan of study for the minor should be developed in consultation with the minor professor and the minor department. The students may also declare a distributed minor by taking classes in more than one department.

The purpose of the minor is to add breadth to a Ph.D. major. Monitoring the course content and credit requirements for Ph.D. minors is the responsibility of the minor department/program. Major departments/programs are responsible for indicating the expected minor (either Option A or B, see below) at the time of the preliminary warrant request.

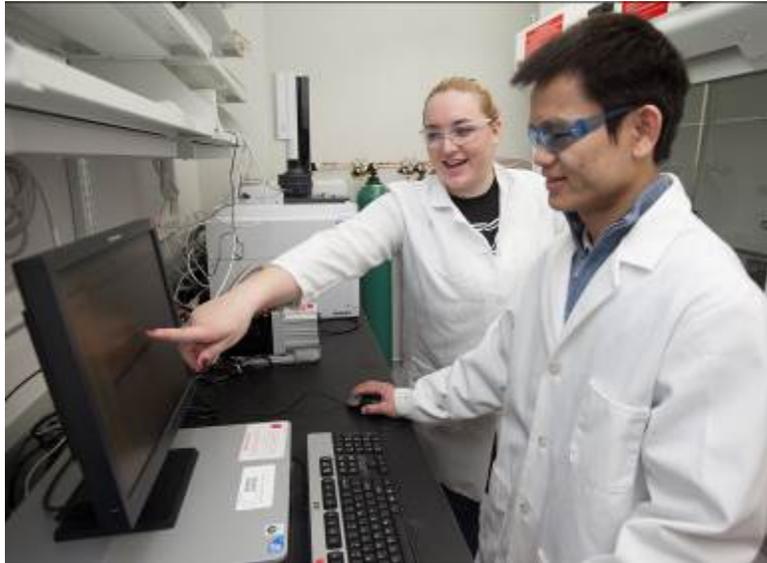
In summary, minor options are as follows:

Option A (external): Requires a minimum of 9 credits in a minor program (single disciplinary or multi-disciplinary). Fulfillment of this option requires the approval of the minor program. (Please complete Option A Minor Approval Form on page 41 in this handbook)

Option B (distributed): Requires a minimum of 9 credits in one or more programs forming a coherent topic, and can include course work in the program. Fulfillment of this option requires the approval of the major program.

The Graduate School's minimum course requirements for the minor include:

- An average GPA of 3.00 on all minor course work.
- Course work must be graduate level (the equivalent of UW-Madison courses 300 level or above; no audits or pass/fail).
- Maximum 3 credits of independent study (e.g., 699, 799, 899, 999).
- Research and thesis cannot be used to satisfy the minor (e.g., 790, 890, 990).
- No more than 5 credits of course work completed more than five years prior to admission to the Ph.D.; course work taken ten years ago or more may not be used.



Graduate students Sarah Krantz and Shengfei Zhou conducting research in Professor Troy Runge's lab.

3.9 Preliminary Plan of Study

Soon after beginning work toward the Ph.D. degree, the student should consult with the major professor to prepare a *Preliminary Plan of Study* and select an area for research. This should be completed by the end of the first year.

3.9.1 Qualifying Examination

A Qualifying Examination is required, except when waived by the major professor, of all students working toward the Ph.D. degree. The purpose of the examination is to provide additional information upon which to base the decision of whether the Ph.D. program is in the best interest of the student and the department and to ensure that the Ph.D. candidate has basic competency in engineering fundamentals, advanced knowledge in an area of specialization, and potential for conducting research at an advanced level. The student's major professor, will appoint a Qualifying Examination Committee. This examination committee, chaired by the major professor, is responsible for preparing, administering and evaluation of the Qualifying Examination which may be written and/or oral at the discretion of the Committee. The examination will have three emphasis areas: engineering

principles, creativity and research ability, and biological systems engineering specialty as designated by the student.

Students entering the Ph.D. program with a B.S. and M.S. degree in engineering must complete the Qualifying Examination no later than their third semester of residency after beginning the Ph.D. program. Students entering the Ph.D. program directly from a B.S. degree or students with no engineering degree must take the Qualifying Examination no later than the fourth semester of residency after beginning the Ph.D. program. The student should check with his/her major professor at the beginning of the Ph.D. program.

Upon evaluation of the Qualifying Examination and review of the student's records, the Qualifying Examination Committee will make one of the following recommendations.

1. The student has passed the Ph.D. Qualifying Examination and is encouraged to continue with the Ph.D. program.
2. The student needs remedial work in one or more areas which can be fulfilled by self-study and passing the Qualifying Examination at the next opportunity or by taking additional coursework in the area (s) at the option of the student's Examination and Guidance Committee. Under no circumstances will a student be allowed more than two attempts at passing the Ph.D. Qualifying Examination.
3. The student has done poorly on the Qualifying Examination and is discouraged from continuing with the Ph.D. program.

The recommendation of the committee will be made in writing to the student, the GIRC, and the Department Chair. The examinations become the property of the department and will not be returned to the student.

Student appeals of the examination procedures or of the committee's recommendation should be addressed to the Chair of the GIRC.

3.9.2 Teaching Experience

Many students graduating with Ph.D. degrees enter an academic environment that requires teaching skills. Even those entering career positions not directly involved with classroom teaching will be working with and supervising others where teaching skills are important. In order to help students prepare for future teaching responsibilities, the department encourages all Ph.D. candidates to gain some teaching experience prior to graduation. This should be done by: (1) taking teaching preparatory classes or (2) assisting the student's major professor in teaching-related classroom activities as assigned by the professor for one semester not more than 10 hours per week. Students should consult their major professor to gain the appropriate teaching experience.

3.9.3 Guidance and Examining Committee

As early as possible in a Ph.D. student's program, a Guidance and Examining Committee shall be selected in consultation with and approval of the major professor. The committee must be appointed before the student takes the Preliminary Examination. The Guidance and Examining Committee must consist of at least four faculty members of professional rank including the major professor who serves as the committee chair. At least one of the members shall be from outside the major department. Preferably one of the members will represent the Minor Department. This committee is

available to advise the student throughout his/her thesis research and will also administer Preliminary and Final Thesis Examinations. (See page 35)



Field work is part of many BSE Graduate Students' daily routine.

3.9.4 Comprehensive Preliminary Examination

The Graduate School does not formally recognize a student as a Ph.D. candidate until he/she has passed the comprehensive Preliminary Examination. The purpose of this examination is to establish that the student has gained an appropriate level of knowledge in Biological Systems Engineering and related fields and is able to apply this knowledge in pursuing independent research. This examination may not be taken until: (1) the Qualifying Examination has been passed, (2) all incomplete grades have been cleared, (3) a minimum of two-thirds of the course work has been completed, and (4) a detailed research plan is prepared and submitted to the Guidance and Examination Committee at least four weeks before the examination. Before the Preliminary Examination is taken, a warrant must be obtained from the Graduate School. The student should request a warrant through the Department's Student Services Coordinator, minimum three weeks prior to the examination. (See page 35)

The examination may be written and/or oral, as desired by the Guidance and Examining Committee. The minor department may require that the student take an additional examination in the minor field, depending upon the policies and regulations of the minor department. If required, the minor department examination must be passed before the student takes the Comprehensive Preliminary Examination. After completing the preliminary examinations and course work, the candidate takes on the status of dissertator which results in reduced fees (dissertators register for only 3 credits each and every semester).

3.9.5 Certification

See Section 3.6 above. Ph.D. candidates should submit their Final Oral Committee Approval Form at least three weeks before the anticipated date of their final dissertation defense. Ph.D. candidates must be enrolled during the term in which they intend to graduate. For more information [Academic Policies and Procedures](#)

3.9.6 Final Oral Examination

The Final Oral Examination covers the thesis and general fields of the major and minor studies. The major professor schedules the examination at a time agreed upon by the candidate, the Guidance and Examining Committee, and the Graduate Schools' Deadlines.

The Graduate School's policies and procedures for the Final Oral Examination may be found in the [Academic Policies and Procedures](#) section entitled Final Oral Examination. Minimum Graduate School requirements for graduate committees are as follows:

1. The chair or co-chair of the committee must be Graduate Faculty from the student's program. The UW-Madison Faculty Policies and Procedures 3.05A stipulates that "the faculty of the Graduate School includes all university faculty defined in 1.02 holding professional rank (professor, associate professor, assistant professor or instructor) in any department with graduate program authority, including those with zero-time appointments in such departments." Committee members who have retired or resigned from the University automatically retain Graduate Faculty status for one year; after one year they are permitted to serve as co-chair or other non-Graduate Faculty committee member.
2. Doctoral committees/final oral examination committee (Ph.D. and DMA) must have at least 5 members representing more than one graduate program, 4 of whom must be UW–Madison graduate faculty or former UW–Madison graduate faculty up to one year after resignation or retirement. At least one of the 5 members must be from outside of the student's major program or major field (often from the minor field).
3. MFA final committees must have at least 4 members, 3 of whom must be graduate faculty or former graduate faculty up to one year after resignation or retirement.
4. Master's thesis committees must have at least 3 members, 2 of whom must be graduate faculty or former graduate faculty up to one year after resignation or retirement.
5. Non-thesis master's committees must have at least one graduate faculty member from the student's program.
6. The required 5th member of a doctoral committee/final oral examination committee, 4th member of an MFA committee, or 3rd member of a Master's thesis committee, as well as any additional members, all retain voting rights. They may be from any of the following categories, as approved by the program executive committee (or its equivalent): graduate faculty, faculty from a department without a graduate program, academic staff (including emeritus faculty), visiting faculty, faculty from other institutions, scientists, research associates, and other individuals deemed qualified by the executive committee (or its equivalent).
7. To receive a Ph.D., DMA, MFA, or Master's degree, students must receive no more than one dissenting vote from their committee.



Graduate Students enjoying a social lunch outing.

4. General BSE Departmental Policies

4.1 Thesis

All students must provide a pdf file on a CD of their thesis for the department library. The department requires all students deposit an unbound copy of their thesis to Memorial Library (Options for dissertation submission for Ph.D. students

http://www.grad.wisc.edu/education/completedegree/Dissertation_options.html

4.2 Professional Society Meetings

Graduate students are strongly encouraged to attend at least one professional society meeting during their tenure as graduate students in BSE. Ph.D. students are encouraged to make at least one technical presentation at such a meeting.

Vilas Research Travel Grant-

Application Information & Timeline:

All applicants for the Vilas Research Travel Award are considered for \$600 awards. Applicants travelling internationally will also be considered for a limited number of \$1500 awards. Awards for

domestic & international travel are available to UW-Madison dissertators and UW-Madison final-year MFA students traveling to conduct research supporting their dissertation or thesis.

Applications are opened at 8:00am on October 1, 2014 and closed at 11:59pm on October 31, 2014. Applicants will be notified of acceptance by November.

For eligibility and how to apply see the link below.

<http://grad.wisc.edu/pd/vilas/research/>



BSE students Julia, Tyler, Jake and Erik received third place in the G.B. Gunlogson Student Environmental Design Competition at the 2014 International ASABE Meeting.

4.3 Office Equipment and Supplies

A stock of office supplies is maintained in Room 115. These supplies may be obtained from office support staff. These supplies are intended to support *departmental business*. Departmental supplies are not to be used to prepare or duplicate class reports, employment correspondence, or copying of library materials unless approved by major professor. Copying of correspondence or personal items is prohibited.

Use of the departmental copier to copy your thesis during preparation for review by your major professor is permissible. However, final copies of your thesis must be done on paper that meets the Graduate School's requirements and must be made at a commercial photocopying facility.

4.4 Services

4.5 Mechanical, Electrical and Technical Assistance

Mechanical, electrical and other technical assistance is available on a limited basis through the departmental Research Shop. Arrangements for such assistance should be made in advance with the major professor and the technician. Since there is usually a waiting list for this service, students are advised to make arrangements several weeks before the work is needed. The technician must be provided with suitable drawings and instructions for completing the work. If project funds are available, these technical services can be arranged with outside sources, such as the University Physical Sciences Laboratory or an outside vendor.

4.6 Photographic Services

A pictorial record of research projects is important, so students are urged to take photographs of their research activities. Departmental photographic equipment is usually available through the on-line equipment checkout WiscCal. You can find the link to the UW calendar in your student center.

4.7 Computer Services

Several computer facilities are available to BSE graduate students. Students should consult with their advisors for appropriate computers and access to them for their projects. Computer facilities available to BSE graduate students include Computer-Aided Engineering (CAE) within the College of Engineering and the CALS Computer Facility located in the basement of the Animal Sciences Building. The department also maintains computers for graduate students' use in the Student Engineering Design Center located in Room 217 of the Agricultural Engineering Building. Please take note of current procedures posted in this laboratory.

4.8 Information Retrieval System

Steenbock, Wendt, and other campus libraries have computerized information retrieval systems. Check with the respective library staff for scheduled workshops and available systems. Extensive information/database search and retrieval is possible through the UW Libraries website. For example, you can request an interlibrary loan copy of a book or journal article not found in the UW library system. This service is made available free of charge. For a nominal fee, you may also request a copy of an article from a journal available at one of the UW Libraries. The UW Library System also subscribes to a number of electronic journals. In many cases the entire journal article can be downloaded and/or printed. Students are strongly encouraged to take full advantage of these resources for their research (This information is covered in detail in BSE 900).

4.9 Use of Department Facilities and Equipment

The Agricultural Engineering Building and Agricultural Engineering Laboratory Buildings are normally restricted to departmental activities. The Department Chair must approve any other use of these buildings. Office support staff, with the approval of your major professor, issue keys. **You may not lend your keys to others.** Graduate students will be issued the necessary keys to carry on their work. With this assignment comes the responsibility of making sure that all outside doors are locked whenever the student is the last to leave. All keys must be returned before you leave the university.

BSE Graduate thesis may be checked out through the departmental office in Room 115. Bound & digital copies of theses are kept in the conference room (Room 212, Agricultural Engineering Building).



Grad students and post docs participate in intramural sports.

4.10 University Vehicles

Vehicles are available for use on research projects and related departmental business. Before using any departmental vehicle for the first time, check with your major professor about the proper procedures to check out vehicles. University policies can be found at:

http://www.bussvc.wisc.edu/risk_mgt/drivetable.html Only those who hold a valid driver's license, have a good driving record, have a state driver's authorization card, and are on the departmental payroll or on the payroll of another department and assigned to a joint research project may drive university vehicles. Vehicles are normally operated on a pool basis and are not assigned to any particular project. Before checking out a vehicle, check the on-line vehicle checkout calendar (WisCal) to see its availability.

Do not use a reserved vehicle without first checking with the research shop supervisor. Keys should be returned to the cabinet when you return the vehicle. Vehicles must be locked and all windows

closed whenever the vehicle is not in use. Drivers are responsible for any parking or driving violation citations received on or off campus.

It is state law that all drivers and passengers in vehicles wear seat belts, and you are expected to obey this law. Parking of both University and personal vehicles on campus is closely regulated. If uncertain about where to park, consult with your major professor or research shop personnel.

In some cases it may be desirable to use your own vehicle. If you expect to be compensated for such use, check with your major professor to be sure money is available for this purpose before using the vehicle.

4.11 Telephones

The University telephone system should not be used for personal long distance calls. Business long distance calls should be cleared with your major professor.

<http://www.doit.wisc.edu/telephone/directory.aspx>.

To make a long distance phone call, you must first dial "8" then "1" and finally the required telephone number. *Do not dial "9" to place a long distance call, as this results in a considerably higher per minute charge to the department.*

5. Use of Research Shop and Laboratories

Specific arrangements are necessary if large equipment is to be moved into any laboratory. Use of teaching laboratories for other than scheduled instruction should be cleared with the instructor in charge of the laboratory. Any special work in these laboratories will not be permitted during the hours of regular class use. Any equipment used for special work in a teaching laboratory must be dismantled and put away so as not to interfere with scheduled classes.

Before beginning any operation which may be very dirty, dusty, noisy or otherwise particularly disturbing to others, obtain permission from the person in charge of the laboratory or your major professor. You will be responsible for cleaning the laboratory and equipment if the job produces more than the normal amount of dust or dirt.

Use of the research shop and laboratories is restricted to the hours of 8 A.M. to 5 P.M., Monday through Friday, unless special permission is obtained from your major professor or research shop personnel. You should inform research shop personnel that you will be working after regular hours. No machinery can be used after hours unless there is another person present that is certified to operate the machinery. A current University ID is required if you will be in the laboratory building beyond normal working hours.

5.1 Research Shop and Laboratory Equipment

Equipment in teaching labs other than instrumentation may usually be used in the laboratory if it does not interfere with scheduled classes. No equipment should be removed from any laboratory without obtaining permission from the instructor in charge of the equipment and properly checking out the equipment. You are responsible for returning equipment you use to its proper storage location in good condition.

6. General Instructions for Use of Research Shop Equipment

Instructional workshops on departmental research shop and safety procedures are given periodically. Ask your major professor when the next class will be held. You are expected to complete this course and sign the department's Shop Safety Form before you use the research shop facility. University regulations require that you be instructed in the use of and checked for your ability to use any power tool. You may use power tools only when someone else, who has been instructed in the use of the tools, is present. This includes both portable and stationary tools for metal- or wood-working.

If you have any doubt or have not been certified for a particular machine, ask one of the staff members or research shop personnel before starting the job. All tools **MUST** be put away in tool kits, cabinets, or racks before leaving the research shop or laboratory. Tools should be cleaned if necessary before storage. If tools must be used at an outside site, they may be left at the job site provided they can be stored in a safe place and research shop personnel have approved the extended use.

Most power tools, electric drills, sanders, etc., have a specific place in the research shop and you are expected to put them back when you are finished with them. If you can't find the proper storage place for a tool, ask research shop personnel or the instructor in charge of the laboratory to help you.

Gasoline shall not be used for cleaning. Cleaning solvents are available for inside use. Don't leave open pans of cleaning fluids in the research shop or any laboratory. Used cleaning fluids must be disposed of in barrels near the southwest corner of the laboratory, Room 130. **DO NOT PUT ANY CLEANING FLUID OR OTHER SOLVENTS, ACIDS, PAINT OR PAINT THINNER INTO DRAINS.** For proper disposal of laboratory chemicals, check with research shop personnel.

Junk and rubbish are to be picked up and deposited in barrels or rubbish containers outside. Ask research shop personnel for proper disposal locations for biological materials such as hay or similar materials.

Workbenches and all machines used must be left clean. Air should not be used to clean equipment parts. Brushes or vacuum cleaners should be used. Useable parts left over at project completion or reclaimed from a salvage operation should be returned to stock.

Tools in boxes or bench drawers in the research shop (Room 140A) are either personal property or permanently assigned to a staff member or employee. You should obtain permission before using such tools. If you need tools or bench space assigned to you, make such arrangements through your major professor.

LATHES, MILLING MACHINES, HORIZONTAL BORING MILL, SURFACE GRINDER, IRONWORKER, AND PRESS BRAKE ARE TO BE OPERATED ONLY BY SPECIAL PERMISSION OF STAFF OR RESEARCH SHOP PERSONNEL.

If you damage a tool, report that fact to your supervisor. Don't store non-functioning equipment. In order to have tools available for use, any damaged tool needs to be turned in promptly so that it can be repaired or replaced. Eye protection is required by University regulations when you are working in the research shop (Rooms 140 and 140A) or at any other location when you are using power or hand tools such as hand grinders, hand drills, sanders, saws or cold chisels or punches which may produce chips or flying particles. You must wear safety glasses whenever you are working in the research shop.

IF YOU ARE INVOLVED IN A SHOP OR VEHICLE ACCIDENT, REPORT IT IMMEDIATELY TO THE RESEARCH SHOP SUPERVISOR OR THE DEPARTMENT ADMINISTRATOR! VEHICLE ACCIDENT REPORT FORMS ARE IN THE GLOVE COMPARTMENT OF EACH VEHICLE ALSO A PROOF OF INSURANCE LETTER IS THERE.

6.1 Laboratory Instrumentation

Much of our instrumentation and equipment is purchased for specific classroom or research projects and is, therefore, the responsibility and under the supervision of the instructor or project leader. However, in the interests of our total departmental program, it is often desirable for equipment to be loaned and shared between projects, between research and instruction, etc.

Every effort should be made to return the instrumentation without damage to its designated location in the laboratory. Report malfunctions of any instrument immediately to the instructor in charge of the laboratory or to research shop personnel so it can be checked or repaired before it is to be used again.

6.2 Laboratory and Research Shop Supplies

Some expendable supplies are kept in the research shop. These may be used after checking with research shop personnel. These may be used as needed for research. Large quantities of these items will not usually be available. If you need a large quantity of some item, check with your major professor to determine how it should be obtained. If you find the stock of some item depleted, report this to research shop personnel so it can be restocked. Your major professor must approve supplies and equipment needed for your research. For procedures for obtaining such items, see your major professor. Plan ahead and allow time for the materials to be received. Processing times may take from one to four weeks. If emergency items are needed, consult with your major professor.



Department Chair Doug Reinemann with Graduate Student Nolan Lacy participate in the annual Cows on the Concourse in downtown Madison.

Biological Systems Engineering Department Graduate Student Certification

The student should complete this form, including appropriate signatures at least 3 weeks prior to requesting warrant.

Purpose: Please check appropriate box

M.S. Thesis Examination	Ph.D. Preliminary Examination *
M.S. Independent Study Examination	Ph.D. Thesis Examination

- If any requirements are missing please explain in the comments section.

Prerequisite at time of Admission:

1. _____
2. _____
3. _____

Proposed Date of Exam: _____

Total graduate course credits MS (16) Ph.D. (32) _____ **Graduate GPA** _____

Must complete both BSE 900 and BSE 901* prior to final exam:

List of courses (500-level and above) and grades (Please also attach UW transcript).

Course #	Course Title	Credits	Grade

*Petition GRIC committee for wavier of 901 in case of graduation earlier than 901 offered.

Student's Name: _____ **Signature:** _____ **ID** _____

I verify that first draft of final copy of prelim proposal/thesis submitted to major professor
 _____ **yes** _____ **no** (major professor please initial)

Major Professor: _____ **Signature:** _____

Comments:

Please write any special message to the Graduate Instruction and Research Committee.

Proposed Minor: _____

(Option A Option B Distributed) (*Proposed date of completion of minor*) _____

Proposed Thesis Title:

MS candidates, do you intend to pursue a Ph.D. in the department? yes / no

MS and Ph.D. Candidates, list your thesis committee members

Name (last, first, middle initial)	Department	Rank

Approved: YES NO

Signature: _____

Chair, Graduate Instruction and Research Committee

Graduate School Degree and Dissertator Eligibility Deadlines 2014-2015

Fall 2014

August 29	Dissertator Eligibility for Fall 2014
November 28 *	Request for all Masters and Ph.D. Degree Warrants
December 19	Degree Deadline (Electronic dissertations due by noon 12:00pm CST)
December 22-January 16	Spring Degree Window Period**

** For master's students only: If you want your name to be printed in the commencement program, your department must submit your warrant request before Friday, November 7, 2014. And you must sign up at MyUW "Apply to Graduate" to attend the commencement ceremony.*

Spring 2015

January 16	Dissertator Eligibility for Spring 2015
April 24*	Request for all Masters and Ph.D. Degree Warrants
May 15	Degree Deadline (Electronic dissertations due by noon 12:00pm CST)
May 18- June 12	Summer Degree Window Period**

** For graduating master's and doctoral students: If you want your name to be printed in the commencement program, your program should submit your warrant request before Friday, November 7, 2014. And you must sign up at MyUW "Apply to Graduate" to attend the commencement ceremony.*

Summer 2015

June 12	Dissertator Eligibility for Summer 2015
August 3	Request for all Masters and Ph.D. Degree Warrants
August 21	Degree Deadline (Electronic dissertations due by noon 12:00pm CST)
August 24-September 1	Fall Degree Window Period**

Fall 2015

September 1	Dissertator Eligibility for Fall 2015
-------------	---------------------------------------

**** Important Note:** The "Window Period" is the time between the end of one degree period and the beginning of the next. **You must have been registered for the previous semester (Fall, Spring, or Summer).** If all degree requirements are met by the end of the window period, your degree will be granted for the **following semester**. However, you will not have to register or pay fees for the next semester.



Faculty/Staff/Student annual fall mixer in the Agricultural Engineering Lab Building.

Helpful Links:

For Master's:

1. Completing Your Degree:
<http://www.grad.wisc.edu/education/completedegree/mdegree.html>
2. A Guide to Preparing Your Master's Thesis:
<http://grad.wisc.edu/currentstudents/mastersthesis>

For Ph.D.:

1. Options for dissertation submission for Ph.D. students
http://www.grad.wisc.edu/education/completedegree/Dissertation_options.html

Master's Degree Warrant Request From

Degree Deadlines:

Fall: **December 19, 2014**

Spring: **May 15, 2015**

Summer: **August 21, 2015**

Fall 2014

Spring 2015

Summer 2015

(Circle session you expect student to complete the degree requirement and graduate.)

Warrant must be requested a minimum of 3 weeks before the defense/exam or the degree deadlines

Date of request:

Date of defense/exam:

Student's Name:

10-Digit ID Number:

(Last, First, Middle)

Student's Program for degree expected:

Degree expected: _____

(Example: MA, MS, MPA, MIPA, MBA, ME, MM)

Is this student in or will they continue for a PhD in the same program? Yes No Undecided

Is this student required to deposit a thesis in Memorial Library? Yes No

Committee Member Names (if applicable):

(Last, First, Middle & Rank)

1. _____
2. _____
3. _____
4. _____
5. _____

Name/Address/Phone Number/Email of Coordinator making this request:

Please send the request form to **217 Bascom Hall**. For a warrant to be issued, the following requirements must have been met when the warrant is requested. If these requirements have not been met, the request will be returned with no action taken.

1. Graduate registration for a minimum of 2 graduate level credits (300 level or above for a grade, no audits, or pass/fail) or degree completion fee must be approved and paid.
2. Students have met the credit requirement for the appropriate degree & has a graduate GPA of at least 3.00.
3. All incomplete and unreported grades, or progress grades in anything other than research/thesis (usually 690, 790, 990) must have been cleared. Independent study (usually 699, 799, or 999) must be given a grade (not progress) each semester.
4. Students receiving a second (or third) master's degree from UW-Madison, & students receiving two degrees during the same semester, must submit official (signed by appropriate advisers or departmental chairs) lists of courses used for *each* degree. See double degree in [Academic Policies and Procedures](#)

The University of Wisconsin-Madison
The Graduate School

Request for Preliminary Warrant

Submit request at least three weeks before exam to the PhD Office, 229 Bascom Hall

Grades and current registration may be checked on ISIS. You will want to check ISIS to know when the warrant has been issued, check credit requirement status, dissertator eligibility, or to identify other problems.

Remember that a warrant will not be issued if there are incomplete grades or progress grades in anything other than research/thesis (usually 990). Independent study (usually 699 or 999) must be given a grade (not progress) each semester.

Student's Name:

10-Digit ID Number:

(Last, First, Middle)

Student's Major:

Proposed Date of Exam:

Proposed Minor:
Completion:

Proposed Date of

(Must be 6 digit)

(Option A—Name It. For example: Option A Music) (Option B Distributed)

PhD Coordinator Making Request:

Address/Phone Number/Email of PhD Coordinator:

The University of Wisconsin-Madison
The Graduate School
PHD FINAL ORAL COMMITTEE APPROVAL FORM

Please submit at least three weeks prior to exam. Type or print clearly.

Date: _____ This is an: (Circle one) Original Form
 Revised Form

Student's Full Name: (Last, First, Middle) _____

Student's 10-digit ID Number: _____

Student's Major: _____ & Minor _____

The PhD final oral exam committee must consist of at least 5 current graduate faculty members from the University of Wisconsin-Madison who are of either assistant, associate, or full professional rank; with at least one of the five from outside the major department.

This form, signed by the adviser/major professor and department chairperson, should be returned to the Graduate School (217 Bascom) **3 weeks before the final oral exam**. The warrant and other degree completion materials will then be sent to the department. If any changes are made in the membership of the committee, a revised final oral exam committee form must be submitted **before the exam**. Changes in dissertation title or date **do not** require a revised form.

The following faculty members have agreed to serve on the Final PhD Oral Exam Committee for the above named student:

NAME: (Last, First, Middle)	RANK	DEPARTMENT/MAJOR REPRESENTED (Full Name)
Adviser		
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
(Optional) 6. _____	_____	_____

Proposed Dissertation Title:

Proposed Date of Final Oral Exam

 Signature: Adviser/Major Professor

 Signature: Department Chairperson

THE DEVELOPMENT OF MADISON
AS AN INTERESTING PLACE

By

Iam A. Student

A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

(Chemistry)

At the

UNIVERSITY OF WISCONSIN-MADISON

2013

YOUR DISSERTATION TITLE (CAPITALIZED)

submitted to the Graduate School of the University of Wisconsin-Madison in partial fulfillment of the requirements for the degree of Doctor of Philosophy

By

The dissertation is approved by the following members of the Final Oral Committee:

Date of final oral examination: Month and year degree to be awarded:

Your full name

Date of final oral examination _____

Month and year degree to be awarded: _____

The dissertation is approved by the following members of the Final Oral Committee

Committee member's name, position title, and program (signature not required)

Committee member's name, position title, and program (signature not required)

Committee member's name, position title, and program (signature not required)

Committee member's name, position title, and program (signature not required)

Committee member's name, position title, and program (signature not required)

Committee member's name, position title, and program (signature not required)

Optional 6th committee member (signature is not required)

<http://www.grad.wisc.edu/education/completedegree/dissertatorcomm.pdf>

Committees (Doctoral/Master's)

Committees (sometimes called "Graduate Advisory Committees" or "Degree Committees") advise and evaluate satisfactory progress, administer preliminary and final oral examinations, evaluate a thesis or dissertation, and/or sign a degree warrant. Students should consult their advisor and their program's student handbook for the specific function of degree committees in their program.

The executive committee (or its equivalent) of a program/department is responsible for approving the composition of all graduate committees. The program/department chair must sign the "Ph.D. Final Oral Committee Approval Form," thus representing the approval of the program/department executive committee (or its equivalent), before the form is submitted to the Graduate School for final approval.

Minimum Graduate School requirements for graduate committees are as follows:

1. The chair or co-chair of the committee must be Graduate Faculty from the student's program. The UW-Madison Faculty Policies and Procedures 3.05A stipulates that "the faculty of the Graduate School includes all university faculty defined in 1.02 holding professional rank (professor, associate professor, assistant professor or instructor) in any department with graduate program authority, including those with zero-time appointments in such departments." Committee members who have retired or resigned from the University automatically retain Graduate Faculty status for one year; after one year they are permitted to serve as co-chair or other non-Graduate Faculty committee member.
2. Doctoral committees (Ph.D. and D.M.A.) must have at least 5 members, 4 of whom must be UW-Madison graduate faculty or former UW-Madison graduate faculty up to one year after resignation or retirement. At least one of the 5 members must be from outside of the student's major program or major field (often from the minor field).
3. M.F.A. committees must have at least 4 members, 3 of whom must be graduate faculty or former graduate faculty up to one year after resignation or retirement.
4. Master's thesis committees must have at least 3 members, 2 of whom must be graduate faculty or former graduate faculty up to one year after resignation or retirement.
5. Non-thesis master's committees must have at least one graduate faculty member from the student's program.
6. The required 5th member of a doctoral committee, 4th member of an M.F.A. committee, or 3rd member of a master's thesis committee, as well as any additional members, all retain voting rights. They may be from any of the following categories, as approved by the program executive committee (or its equivalent): graduate faculty, faculty from a department without a graduate program, academic staff (including emeritus faculty), visiting faculty, faculty from other institutions, scientists, research associates, and other individuals deemed qualified by the executive committee (or its equivalent).
7. To receive a Ph.D., D.M.A., M.F.A., or Master's degree, students must receive no more than one dissenting vote from their committee.

<http://www.grad.wisc.edu/education/acadpolicy/guidelines.html#31>

Summer enrollment requirements:

Students must be enrolled at UW-Madison if they are using university facilities, including faculty and staff time.

- Dissertators defending and/or depositing dissertation (completing their degree) in summer must enroll for 3 credits* in the general 8-week (DHH) session.
- Non-dissertators completing a summer Ph.D. degree must enroll for at least 2 credits* in the general 8-week (DHH) session.
- Master's candidates, who expect to graduate in summer must enroll for at least 2 credits* in any session (short session or 8-week general).
- International students who are completing a summer degree are required to enroll for at least 2 credits* in the general 8-week (DHH) session.
- Dissertator RAs must enroll for 3 credits* in the general 8-week (DHH) session.
- Dissertator fellows with 12-month appointments are required to enroll for at least 3 credits* in the general 8-week (DHH) session.
- Dissertator trainees are required to enroll for at least 3 credits* in the general 8-week (DHH) session.
- Non-dissertator RAs must enroll for 2 credits* in the general 8-week (DHH) session.
- Non-dissertator TAs and PAs not receiving a summer degree have no enrollment requirement. However, those who held such an appointment during the previous semester may qualify for summer tuition remission and are advised to consult with their department if they wish to enroll.
- Non-dissertator fellows with 12-month appointments are required to enroll for at least 2 credits* in the general 8-week (DHH) session.
- Non-dissertator trainees are required to enroll for at least 2 credits* in the general 8-week (DHH) session.
- International students who are RAs are required to enroll for at least 2 credits* in the general 8-week (DHH) session.
- International students who are not completing a summer degree and who are not RAs have no summer enrollment requirement mandated by the U.S. federal government regulations for F-1/J-1 visa holders.

<http://www.grad.wisc.edu/education/acadpolicy/guidelines.html#EnrollmentRequirements>

Option A Minor Approval Form for Biological Systems Engineering

Name: _____

ID Number: _____

Option A Department: _____

The purpose of the minor is to add breadth to a Ph.D. major. Monitoring the course content and credit requirements for Ph.D. minors is the responsibility of the minor department/program. Major departments/programs are responsible for indicating the expected minor (either Option A or B, see below) at the time of the preliminary warrant request.

Option A (external): Requires a minimum of 9 credits in a single department/program. Selection of this option requires the approval of the minor department/program.

Department & Course Number	Instructor	Course Title	Grade	Cr. #

Grades Verified By: _____
 (Signature) (Date)

I approve the above graduate courses for use in satisfying the Ph.D. Option A Minor Agreement.

Advisor Printed Name

Advisor Signature _____ **Date** _____

Minor Department Approval _____ **Date** _____

**Please return this completed form to the Student Services Office in 115 Agricultural Engineering Building.*