

**BIOPRODUCTS AND BIOSYSTEMS SCIENCE, ENGINEERING, AND
MANAGEMENT GRADUATE PROGRAM
OPERATING PROCEDURES
UNDER THE GRADUATE SCHOOL CONSTITUTION**

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Item 1. Graduate Faculty Membership (Art. III-2.b & d)¹

Categories of membership in the Bioproducts and Biosystems Science, Engineering, and Management (BBSEM) Graduate Program are Senior Member, Member, Affiliate Senior Member, and Affiliate Member. Senior Members and Members shall be University faculty and normally will hold an earned Ph.D. or equivalent doctoral degree. Other faculty and research staff who could contribute significantly to graduate student programs based on their professional experience even though without a Ph.D. may be nominated for Affiliate Membership. Members must have a strong research record demonstrated by significant refereed publications in which the nominee has played a major role in guiding the research. Experience in teaching and advising of graduate students is highly desirable for Members, though not mandatory.

A Member or Senior Member of the BBSEM Graduate Faculty may nominate individuals to any category of membership of the BBSEM Graduate Program. The nomination, which shall include appropriate information about the nominee's qualifications (documentation of teaching, advising, research, and service to the Graduate School), is then given to the Director of Graduate Studies (DGS), who will present it for review and vote to the voting members of the BBSEM Graduate Program. An electronic or written vote shall be taken on such nominations. If two or more Graduate Faculty members request discussion of the nominee's qualifications, the DGS shall call a meeting of the Graduate Faculty to discuss the nominee's qualifications before the vote is taken. Upon approval, the DGS shall forward notice of the appointment to the Dean of the Graduate School. The appointment shall become effective upon the Graduate School's receipt of this notification.

Item 2. Privileges and Responsibilities of Graduate Faculty Members and Faculty Governance (Art. III-2.b, Bylaw 6 and Art. III-3)

Senior members shall enjoy full privileges and responsibilities in the BBSEM Graduate Program, as outlined in the Graduate School Constitution, Article III-2b, Bylaw 6. Members and Affiliate Members may advise M.S. students and they may co-advise Ph.D. students as long as the other co-advisor is a Senior Member of the Graduate Faculty. Members and Affiliate Members may serve on student examination committees for Doctoral degrees and as a thesis reviewer, both for students within the BBSEM Graduate Program and as an external examiner for students enrolled in other Graduate School programs. Affiliate Senior Members and Affiliate Members shall not participate in governance of the BBSEM Graduate Program. The voting faculty of the BBSEM Graduate Program shall have direct responsibilities as outlines in the Graduate School Constitution Article III-3.

¹ References in Item titles are to relevant articles in the University of Minnesota Graduate School Constitution as approved by the Graduate School Constitutional Assembly on March 26, 2002, and the Executive Vice President and Provost on May 13, 2002.

Any change to the structure or function of the BBESM Graduate Program not resolved by consensus requires a written (mail or electronic) vote of the voting membership of the Program, in which a simple majority vote is required for approval.

Item 3. Criteria Governing Continued Graduate Faculty Membership for Retirees and Professors Emeriti (Art III 2.b, Bylaw 11)

Faculty who retire from the University of Minnesota relinquish their Graduate Faculty status upon retirement; however, they may choose to complete outstanding examining committee and advising assignments on file with the Graduate School at the point of retirement. The voting faculty of the BBSEM Graduate Program may appoint emeritus faculty to Affiliate Membership and Affiliate Senior Membership when such status serves the educational interests of the Program and its graduate students.

Item 4. Selection of Graduate Program Committee (GPC) Members (Art. III 3)

Five or more BBSEM Graduate Faculty members and one graduate student shall be appointed to the Graduate Program Committee (GPC) by the Department Head, for a term of three years. The membership should reflect as broadly as possible the BBSEM Program's interest in graduate education with no more than three faculty being replaced each year. Openings due to attrition shall be filled as soon as they occur. The DGS shall be an ex-officio member of the GPC. Graduate student participation in Program governance shall be confined to matters of general administrative and educational policy and shall not extend to consideration of applications, petitions, or evaluations which relate to the employment status or academic work of individual students, or to the setting of student examinations.

A Chair of the GPC will be selected by majority vote among the GPC members. The term of the GPC Chair will be no more than three years.

Item 5. Nomination and Duties of Director of Graduate Studies (Art. III 4.a, b, & c)

The BBSEM Graduate Program shall have a Director of Graduate Studies (DGS) who shall supervise and coordinate the administration of the Program, serve as a point of contact for graduate students enrolled in the Program, provide administrative linkage between the graduate faculty and the BBE Department, and act as the liaison between the Program and the administration of the Graduate School. The voting faculty of a BBSEM Graduate Program and the DGS shall have authority to administer and govern the Program.

The Dean or Administrator of the Graduate School shall appoint the DGS. The GPC or BBSEM Program faculty shall submit to the Dean the name of a nominee as voted by a majority of the Members and Senior Members in the BBSEM Graduate Program. The nomination form should also carry the signature of the BBE Department Head.

The DGS is required to place on file with the Graduate School the BBSEM Program's procedure for choosing the name(s) in nomination for DGS and the length of term in office. Typically this information will be entered into the Program Profile on-line. The

BBE Department head shall endorse the final appointment by the Dean and specify the support that the DGS will have during the term of the appointment.

The DGS shall serve a three-year term beginning September 1st of the year in which he or she is elected. The Graduate Faculty will vote to either reappoint the existing DGS or nominate a new DGS after the three-year term. In the absence of the DGS for less than one semester, the BBE Department head shall designate an Acting DGS and so notify the Graduate School. For an absence longer than one semester, BBSEM Program faculty shall nominate an interim DGS and so notify the Graduate School.

The DGS shall call and preside over all meetings of the Graduate Faculty. Upon the request of any BBSEM Graduate Faculty member, the DGS is obligated to call a meeting of the BBSEM Graduate Faculty.

The DGS shall supervise and coordinate the administration and governance of graduate studies within the BBSEM Graduate Program. The DGS shall:

- serve as the program's representative on the appropriate Policy and Review Council(s).
- serve as a liaison between the program faculty and the Graduate School administration, referring matters to the faculty or its committees as needed; informing the faculty of Graduate School policies, deadlines, and programs as appropriate; and forwarding recommendations, nominations, and other information from the faculty to the Dean.
- provide written criteria to each student, upon entry, of what constitutes acceptable progress through and termination of the student from the program.
- receive, arrange for the review of, and monitor the progress of student applications and petitions.
- orient and counsel graduate students with respect to program and degree requirements until a permanent adviser is selected and assist in that selection as necessary. Enforce regulations of the Graduate School and the degree program. Oversee the maintenance of graduate student records and the annual student evaluation process.
- provide periodic reports on the program and data to the appropriate Policy and Review Council and to the Dean as requested by the Council or Dean.
- carry out such other responsibilities as specified in the Graduate Constitution bylaws.
- facilitate a program of professional development activities for graduate students within the program.

The DGS acts on petitions for changes in degree programs, but he or she may refer them to the GPC if major changes in content are involved.

The DGS shall annually evaluate the progress of graduate student recruitment, application processing and progress of current students as well as any problems encountered and report to the GPC.

The DGS shall report, with a copy of the student's program, approval of any designated minors to the GPC.

A. Removal (Art. III 4.c)

The DGS may be removed by a two-thirds majority vote of the voting faculty of the BBSEM Program or by the Dean of the Graduate School, after appropriate consultation.

Item 6. Positions of Leadership

Of the four positions of leadership - DGS, Policy and Review Council Representative, GPC Chair, and Department Head - no more than two positions shall be held by one person.

Item 7. Graduate Courses (Art. III-3)

The GPC shall consider initiation, modification, or termination of all 8000-level courses and then submit a recommendation to the Graduate Faculty. A majority vote of the Graduate Faculty shall be required to implement any such coursework recommendation from the GPC. The DGS shall forward course changes approved by the Graduate Faculty and a summary of the course content to the Physical Sciences Policy and Review Council for review and action.

Item 8. Teaching of Graduate Courses by Non-Graduate Faculty (Art. III-3)

The GPC or Graduate Faculty Members may nominate individuals to teach graduate-level courses without holding membership in the graduate faculty, subject to the corresponding Policy and Review Council's guidelines. A majority vote of the Graduate Faculty membership is required for approval of such teaching assignments.

Item 9. Review and Recommendation of Degree Programs (Art. III-3)

A student in consultation with his or her advisor shall prepare a degree program. The advisor will ensure that the program complies with the existing criteria for programs within the BBSEM Graduate Program. The advisor shall submit the program with a brief explanation of the program objectives, coursework, and suggested examination committee membership to the DGS. All proposed examination committee members should be contacted by the student or advisor and have agreed to serve on the student's examination committee.

The student, the student's advisor, the DGS, and the GPC chair shall work together in a cooperative, iterative process to develop a degree program that meets the student's goals and all Graduate School, BBSEM Program, and subject matter requirements for that student. The GPC may see copies of programs approved by the DGS and GPC chair, but the full GPC shall not participate in the program approval process unless

requested by the student, advisor, DGS, or GPC chair. If the GPC is asked to consider a degree program and it does not approve the program, the student's advisor and/or the student may ask the full BBSEM Graduate Faculty to consider the program.

Members of the student's examination committee shall receive copies of approved degree programs. Approval of programs shall be announced to BBSEM Graduate Faculty and interested BBSEM Faculty can contact the BBSEM Graduate Program secretary to view approved programs.

Master's programs must be filed with the Graduate School by the time students have completed 10 semester credits. Doctoral programs must be submitted to the Graduate School at least one semester before the term in which students plan to take their oral preliminary examination. Students should submit programs to the BBSEM DGS early in the semester in which Graduate School deadlines occur in order to allow time for the BBSEM departmental approval process.

Any degree program changes shall be submitted by petition to the DGS.

Item 10. Admission Policy for Entry to Graduate Study in Bioproducts and Biosystems Science, Engineering, and Management (BBSEM)

Students seeking a **master's** degree should have a bachelor's degree in engineering, mathematics or the physical or biological sciences, or a related field from a recognized U.S or international university. Applicants should have a performance level on previous academic work required for a degree of at least a 3.0 grade point average (on a 4.0 grading scale).

Students seeking a **Ph.D.** degree should have a master's degree in engineering, mathematics, or the physical or biological sciences, or a related field from a recognized U.S or international university. Applicants should have a performance level on previous academic work required for a degree of at least a 3.2 grade point average (on a 4.0 grading scale). Students expecting to pursue a Ph.D. normally complete an M.S., Plan A degree before starting their Ph.D. programs. Exceptional students that want to go straight to the Ph.D. from the bachelor's level may be admitted subject to conditions agreed upon by the advisor, the DGS, and the GPC.

The Graduate Record Examination (GRE Aptitude) is required of all students being considered for admission to the BBSEM Graduate Program.

International applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL) and have a minimum score of 79 with scores of at least 21 and 19 on the Writing and Reading Sections, respectively on the Internet based TOEFL (550 on the paper based TOEFL). However, any international student who has completed, in good standing, 24 quarter credits or 16 semester credits as a full-time student in residence at a recognized college or university in the U.S. within the past 24 months may petition for a waiver of TOEFL exam requirement.

Item 11. Review of Applications for Graduate Program Admission (Art. III-4)

Once a student's application file is complete (transcripts, TOEFL scores for non-English speaking students, GRE scores, three reference letters, and personal goals statement), the DGS shall review the file to determine if the applicant meets the minimum acceptance standards as specified, herein. If the DGS deems that the applicant does not meet the minimum acceptance standards, the DGS will confer with the GPC chair for consensus. If the DGS deems that the applicant meets minimum acceptance standards, the DGS then seeks a prospective advisor from the BBSEM Graduate Faculty in the student's area of interest who will provide a more thorough review of the applicant and make a recommendation for admission or rejection to the DGS. If no prospective advisor can be found the DGS or the GPC chair will evaluate the applicant's file. If the prospective advisor and DGS agree on the recommendation, the file shall be forwarded to the Graduate School. If the application needs further discussion (for example, to set conditions for conditional admission), the file shall be forwarded to the GPC chair before it goes to the Graduate School.

The DGS will make known to the BBSEM Graduate Faculty the status of all admitted graduate program applicants on a periodic or semester basis.

Item 12. Student Applications for Change of Status/Readmission

The DGS and chair of the GPC shall review and act upon all student applications for change of status or readmission. If necessary, either the DGS or the chair of the GPC may ask the full GPC to consider the application. The graduate student representative on the GPC shall not take part in the vote on student applications. Where appropriate, the action taken shall be circulated to the Graduate Faculty for their information.

Item 13. Graduate Student Support Funds

The BBE Department Head shall be responsible for the assignment of support funds to graduate students, but the Department Head shall consult with student advisors before assigning or removing student support. With respect to Graduate School Fellowship funds, the DGS provides the Department Head with graduate student nominations and appropriate nomination support information.

Most of the Department's funds for graduate assistantships are provided by the Minnesota Agricultural Experiment Station or by individual research grants. Assistantships are not scholarships; they are reimbursement for half-time work on the research project that provides the funds. Students are expected to work an average of 20 hours per week on the research project that provides the funds even during semesters when they are taking classes. In most cases, students are able to use the research project that provides their assistantship for their thesis or Plan B project work. In some instances, however, where funding sources do not match the student's interest, the student will need to work 20 hours per week on a research project that is different from their own thesis or Plan B project research.

The Bioproducts and Biosystems Engineering Department's goal is for master's students to finish their degrees within 21 months and students should expect assistantship support for no more than 21 months. The Department's goal is for Ph.D.

students to complete their degrees within 33 months and students should not plan on more than 33 months of assistantship support. Also, students who come to the department without financial support should not expect that the department will supply an assistantship later on.

Item 14. Graduate Student Committees

BBSEM students shall work with their advisors to select committee members who can help advise the student and evaluate the student's work. The proposed list of committee member names is submitted with the degree program and is subject to approval by the DGS, GPC chair, and Graduate School. Master's level committees must include two BBSEM Graduate Faculty members and one University of Minnesota faculty member from a related graduate program (who is not a BBE faculty member). Four or more committee members are required for Ph.D. students. Ph.D. committees should include three BBSEM Graduate Faculty members and at least one University of Minnesota faculty member from a related graduate program (who is not a BBE faculty member).

Students should communicate regularly with all of their committee members to get their ideas and advice, and to keep them informed about research progress. Students need to contact committee members well in advance of exams to determine committee member availability; committee member schedules might prevent them from being available at times when students would like to have their exams.

Ph.D. students also have a committee appointed to evaluate their written preliminary exams. Guidelines for the written preliminary examining committee are listed under Item 18B2.

Item 15. Guidelines for Development of Master's Programs in Bioproducts and Biosystems Science, Engineering, and Management

It is expected that degree programs will have significant content that is consistent with the Program's mission and objectives. This also applies to students who are admitted to the Program without previous degrees in Bioproducts and Biosystems Engineering. The BBSEM Graduate Program offers the following master's degree options.

Master of Science with Thesis (M.S., Plan A): This is a research-oriented degree where students write a thesis based on their own research. Students can expect to develop good problem-solving skills and other skills that will enable them to succeed in a wide variety of careers. Students expecting to pursue a Ph.D. would normally complete an M.S., Plan A degree before starting their Ph.D. programs.

Master of Science without Thesis (M.S., Plan B): This degree is similar to the M.S., Plan A except that instead of completing a major research project and writing a thesis, students complete a smaller project or projects that involve a total of about 120 hours of work and write Plan B papers on their projects.

Program requirements for BBSEM master's students are as follows:

- Degree programs developed by BBSEM graduate students should include mostly science and quantitative courses.
- All master's level students must take BBSEM 8001, Seminar I (1 semester credit) and BBSEM 8002, Seminar II (1 semester credit).
- All master's level students must take BBSEM 8013, Parameter Estimation (3 semester credits) unless they can demonstrate to the BBSEM 8013 instructor that they have already mastered the course material or have justified the selection of a suitable alternative.
- All master's level degree programs must include a minimum of 30 semester credits. The credit total must include a minimum of 20 semester course credits with at least 14 credits in the major field and at least 6 credits in a related field outside the major. BBSEM 8001, 8002, and 8013 are counted in the major field course credits. M.S., Plan B students take 20 course credits plus 10 credits in areas agreed upon by the advisor and the GPC. (See Item 6 for information on program approval.) M.S., Plan A student takes 20 course credits plus a minimum of 10 thesis credits (BBSEM 8777).
- Degree programs are expected to include mostly 5000- and 8000-level courses. If the degree program contains more than three 4000-level courses, students and their advisors are asked to include a letter of explanation when the degree program is submitted for approval.
- If a master's degree program includes more than 4 semester credits of special problems or advanced problems courses, students and their advisors are asked to include a letter of explanation when the degree program is submitted for approval.
- Students must maintain a minimum GPA of 2.8 (on a 4.0 scale) for courses included on the official degree program.
- All master's level students must pass a final oral exam in order to graduate. Students and their advisors should discuss in advance whether the exam will cover coursework and/or the projects on which they worked for their degree.
- All BBSEM master's students are encouraged to write at least one article for a refereed journal, or prepare some other scholarly work (for example, literature review, research proposal, extension bulletin, website, or teaching materials).

Item 16. Guidelines for Development of Ph.D. Programs in Bioproducts and Biosystems Science, Engineering, and Management

The Ph.D. program in Bioproducts and Biosystems Science, Engineering, and Management is intended to move students to the cutting edge of research in their subject matter area. Students develop skills that enable them to define problems or research questions, plan research, conduct research and/or lead research efforts,

analyze data, and communicate research results in a number of ways to a variety of audiences. The Ph.D. program should build upon a strong undergraduate program in engineering, mathematics, or the physical or biological sciences, and should progress in rigor to prepare the student to attack advanced scientific and engineering problems that are new to the student and well beyond the scope of the student's undergraduate degree. In view of the rapidity with which technology advances, the program should prepare the student to comprehend, develop strategy, and effectively attack a wide range of engineering and scientific analyses and problems. Therefore, the student's program should not be limited to a narrow, specific topic, but rather should reflect an in-depth concentration in several related and advanced scientific and engineering areas of study. The program should develop a sound, logical approach to the thesis topic and the ability to handle new problems in the future. Program requirements for BBSEM Ph.D. students are as follows:

- All Ph.D. degree programs must include a minimum of 45 semester course credits beyond the B.S. and a minimum of 24 doctoral thesis credits (BBSEM 8888). Ph.D. degree programs include relevant master's level course work and the Ph.D. degree program form should list all master's course work that is to be counted in the course credit total. Note that for students who did not receive their master's from the University of Minnesota, 60% of the total course credits must be from the University of Minnesota.
- A minimum of 12 semester course credits must be in a minor field or in a supporting program.
- Graduate credits earned while admitted to pursue University of Minnesota graduate-level degrees (offered by a unit other than the Graduate School) may be applied to the Ph.D. degree. The number of graduate credits accepted for transfer is determined on a case-by-case basis by the DGS and the GPC. Only credits where a 3.0 or higher grade may be applied to the Ph.D. degree.
- Per Graduate School policy, a maximum of 12 semester credits of completed graduate-level coursework while in non-graduate degree status may be considered for transfer. The registration procedure outlined in the current Class Schedule, "Registering for Graduate Credit," must be followed for these courses to be considered for transfer by the Graduate School. Only credits where a 3.0 or higher grade have been earned will be considered for transfer.
- Per Graduate School policy, in the case of a transfer from a non-U.S. institution, credits to be transferred must have been earned in a program judged by the Graduate School to be comparable to a graduate degree program of a regionally accredited institution in the United States. Only credits where a 3.0 or higher (on a 4.0 scale) grade have been earned will be considered for transfer.

- Ph.D. degree programs should contain a minimum of 9 semester course credits in a concentrated area of scientific or mathematical theoretical development that is related to the student's research.
- All Ph.D. degree programs must include BBSEM 8001, Seminar I (1 semester credit), BBSEM 8002, Seminar II (1 semester credit). Any of these courses that are taken at the master's level count toward the Ph.D. and do not have to be retaken.
- All Ph.D. degree programs must include BBSEM 8013, Parameter Estimation (3 semester credits) unless students can demonstrate to the BBSEM 8013 instructor that they have already mastered the course material or have justified the selection of a suitable alternative. Students who took 8013 before starting their Ph.D. do not have to retake the course.
- Ph.D. degree programs are expected to include mostly 5000- and 8000-level courses (courses primarily for graduate students). If the degree program contains more than two 4000-level courses (courses primarily for undergraduates) beyond the courses taken for the master's degree, students and their advisors are asked to include a letter of explanation when the program is submitted for approval. [Note that students who receive their M.S. from the University of Minnesota are allowed to take up to three 4000-level courses without writing a letter of explanation. These students would be allowed to take another two 4000-level courses for their Ph.D. without writing a letter of explanation.]
- If a Ph.D. degree program includes more than 8 semester credits of special problems or advanced problems courses, students and their advisors are asked to include a letter of explanation when the degree program is submitted for approval.
- Ph.D. students are allowed and encouraged to take up to 3 semester course credits outside of their major area of interest in areas that will broaden their program and help them achieve their academic goals. Examples include (but are not limited to) courses on classroom teaching, extension work, communication skills, or business management. These credits may be counted in the 45-credit minimum.
- Students must maintain a minimum GPA of 3.0 (on a 4.0 scale) for courses included on the official degree program.
- Students must pass preliminary written and oral exams, write a dissertation, and pass a final oral exam. The preliminary written exam is a dossier on proposed dissertation research. (See Item 18.) Dissertations may be a series of papers that are suitable for publication.
- A dissertation topic should be selected with emphasis in sound theoretical formulation, development of research procedure, data collection, and data analysis. The project should demonstrate the student's ability to work independently as a research scholar.

- All BBSEM Ph.D. students are encouraged to write two or more articles for refereed journals, or prepare some other scholarly work (for example, literature review, research proposal, extension bulletin, website, or teaching materials).

Item 17. Graduate Student Seminars

Each graduate student shall present two seminars to the faculty and graduate students of the Department. The requirement for the first seminar shall be fulfilled through enrollment in BBSEM 8001. The second seminar shall be presented after completion of the research or projects and shall report results. The Graduate School requires that Ph.D. students give a public seminar "to which the scholarly community is invited" as part of their final exam. This seminar fulfills the requirement for the student's second seminar. All graduate students in the BBSEM Program shall be expected to attend such seminars except in cases of course schedule conflicts. It shall be the responsibility of the student in consultation with the student's advisor to schedule the seminars with the chair of the Department Seminar Committee.

Item 18. Ph.D. Written Preliminary Examination

A. Objective

The Graduate School and this graduate program require that all doctoral students pass a preliminary written examination in the major field. The BBSEM Program's objective for the preliminary written examination is to have the doctoral student demonstrate his or her ability to formulate and describe a scholarly research program that successfully applies and integrates scientific and/or engineering knowledge to solve problems in the student's area of emphasis.

B. Guidelines

1. A dossier prepared by a doctoral student shall be the preliminary written examination for the student.
2. A three-member dossier examining committee appointed by the DGS in consultation with the student, advisor, and GPC Chair will evaluate the dossier. The committee for each student will be drawn from among the Program Graduate Faculty membership (excluding the student's advisor) and the Graduate Faculty in related fields who are members of the student's examining committee. If the graduate faculty member in the related field is unable to review the dossier in a timely manner the DGS and student's advisor will discuss alternate external reviewers.
3. Students are encouraged to consult with their advisor and their dossier examining committee prior to completion of their dossier. However, the advisor and dossier examining committee shall not review or edit written drafts of a student's dossier.
4. More detailed instructions for students preparing the dossier are available from the DGS. The dossier should include the following sections:
 - a. Title

- b. Introduction The introduction should describe the importance, need, and motivation for the research.
 - c. Objectives or Hypothesis to be Tested – Succinctly state the objectives or hypothesis to be tested for the proposed thesis research.
 - d. Literature Review – The literature review should briefly summarize key findings and concepts in selected articles that support the introduction, objectives or hypothesis, and planned thesis research. It should explain the uniqueness of and rationale for the proposed research.
 - e. Research Plan – The research plan should describe the work plan, methodology, and schedule proposed to accomplish the research objectives.
 - f. Summary – A summary, 500 words maximum, should be included.
 - g. Biographical Sketch – A brief one page biographical sketch that describes one's background and aspirations should be included.
 - h. References – Published literature cited in the dossier shall be referenced and listed in the reference section. References should be accurate, complete, and in a standard publishable format.
5. Length and Format
- a. The dossier should be 40 pages maximum excluding the biographical sketch, references, and any appendices.
 - b. Use a 12-point font.
 - c. Double-space the text.
6. The dossier will be evaluated based on the following criteria:
- a. The discussion of the key relevant literature and the doctoral student's conceptual grasp of the subject.
 - b. Originality, creativity, and uniqueness of the proposed research.
 - c. Feasibility of the proposed project, suitability of the proposed methodology, and adequacy of the project description including scope and timeliness appropriate for a doctoral thesis.
 - d. Scientific merit and quality of the proposed research project.
 - e. Written presentation, ability to communicate the subject clearly and effectively.
7. Each member of the dossier examining committee shall complete a dossier-rating sheet within three weeks.
8. The dossier examining committee will indicate to the DGS, student, and the student's advisor the results as follows: 1) Pass, 2) Pass with conditions, 3) Rewrite, or 4) Fail and dismissal from the program. The pass with conditions may specify additional course work or other actions appropriate. Rewrite may specify either full or partial dossier rewriting requirements. The dossier examining

committee may limit the number of rewrites to one (i.e., original dossier plus one full rewritten dossier).

9. A doctoral student has passed the written preliminary examination when a majority of the dossier examining committee and the advisor approve the student's dossier.
10. After a student passes the written preliminary exam, the results of the evaluations may be discussed with the student in individual conferences between the student and members of the dossier examining committee or with the whole committee and the advisor at a meeting of the dossier examining committee.

C. Timing

Students with grant or departmental support (at least half time) shall submit the preliminary written examination dossier for evaluation within 21 months after beginning their Ph.D. program. For example, students beginning their Ph.D. program during Fall semester shall submit their written preliminary exam dossier by the end of Spring semester during the second academic year in residence. Students not provided support should submit their preliminary examination dossier prior to completing their degree program course work. Exemptions due to extenuating circumstances may be granted by the GPC in response to a student petition.

Item 19. Ph.D. Oral Preliminary Examination

The overall purpose of the preliminary oral exam is to determine whether prospective Ph.D. candidates have developed the capabilities needed to successfully carry out the remainder of their Ph.D. programs, especially the Ph.D. dissertation research. (At this point in time, a "substantial part" of the course work will have been completed as stated in the Graduate School Catalog). Upon passing the preliminary oral examination, a Ph.D. Student becomes a doctoral candidate as stated in the Graduate School Catalog.

A. Objectives

The BBSEM Graduate Faculty recognizes the following objectives for the Ph.D. oral preliminary examination:

1. To determine whether the Ph.D. student has an adequate understanding of the scientific and engineering sciences fundamental to the selected area of specialization.
2. To determine whether the examinee has an adequate understanding of general research techniques, especially the principles and proper roles of theoretical development, experiments, statistical analyses, and mathematical modeling as applied to the area of specialization.

B. Guidelines

The Graduate School Catalog contains guidelines and requirements concerning scheduling, content and outcome, and reporting of results of oral preliminary examinations. These should be read carefully since they take precedence over any Program requirements and guidelines.

The following are BBSEM Program guidelines for the scheduling, procedures and content of the oral preliminary examination. They are not requirements, unless so worded, but should be observed to the extent possible.

1. The oral preliminary examination shall be taken after the written preliminary examination. If for some reason this creates a hardship, the student may apply to the DGS for an exception, which shall be referred to the GPC.
2. The oral preliminary examination should be scheduled as soon as feasible after the written preliminary examination and no later than the end of the semester immediately following the semester of the written preliminary examination. Exceptions to this rule may only be approved by a decision of the GPC. The purpose of this guideline is to avoid undue delay if the student's committee should, as an outcome of the oral exam, recommends that additional course work be added to the student's program.
3. The student's major advisor shall chair the preliminary oral exam. The entire committee shall be present.
4. Although no duration is specified, a minimum of two hours shall be made available for the exam.
5. The student should be prepared, if requested to do so by the advisor, to present and defend a proposed research plan for the Ph.D. dissertation. However, the content of the exam shall be broader than the proposed research with ample opportunity for each committee member to ask questions on other topics.
6. The questions asked of the examinee should be designed to elicit responses that will accomplish the objectives stated above. Emphasis should be on scientific principles and their application.
7. At the time of the examination, as stated in the Graduate School Catalog, "the committee chair shall stipulate the objectives of the examination" which are given above, and "in consultation with the other members of the committee will determine how the examination is to be conducted."
8. According to Graduate School Policy: The outcome of the examination, with all committee members present and voting, is recorded in one of three ways: pass, pass with reservations, or fail. The voting proportions necessary for these decisions are as follows: if the committee consists of four members, a favorable verdict for passing consists of either a unanimous vote or a vote of 3–1; if the committee consists of five members, a unanimous vote or a vote of 4–1 is needed; if the committee consists of six members, a unanimous vote or a vote of 5–1 or 4–2 is needed; and if there are seven members, a unanimous vote or a vote of 6–1 or 5–2 is needed. Candidates who do not earn committee votes in

these proportions fail the examination. If, to achieve the minimum number of votes to reach a verdict of pass, any vote of pass with reservations is included, then the outcome will be recorded as a pass with reservations. A vote to pass the student with reservations still constitutes a passing vote.

9. If the student passes the examination with reservations, the student is informed immediately, but the committee is permitted one week in which to convey its reservations to the student in writing, informing the student of the steps that must be taken to remove them (a copy of this letter must be sent to the Graduate School and should accompany the signed Oral Examination Report Form). This may take the form of an additional course (or more) to be taken for credit, preparation of a paper on an assigned topic, solution of an assigned problem, or some other appropriate assignment. Reporting of an outcome of this type and the corrective action(s) shall follow the procedures for “Reporting of Results” stated in the Graduate School Catalog. When the student has satisfied the committee's reservations, a second letter informing the student and the Graduate School that the reservations have been removed and that the student may proceed toward the degree is also required. Both letters should be written by the committee chair. The final oral examination may not be scheduled until the Graduate School has received a copy of the letter indicating that the reservations have been removed.

If the committee members disagree as to whether the reservations have been satisfactorily removed, the committee chair asks for another vote, the results of which are subject to the same voting proportions as the initial vote. If the student is unable to satisfy the committee's reservations, his or her doctoral candidacy and graduate student status may be terminated.

Item 20. Appeals

Appeals shall be handled in accordance with informal resolution guidelines provided by the Student Academic Grievance policy.

The GPC shall review and act upon appeals of DGS action. An appeal of DGS action shall be made in writing and submitted to the GPC chair.

The Graduate Faculty shall review appeals of GPC actions. Appeals of GPC action shall be made in writing and submitted to the DGS.

Informal resolution may be sought from the Graduate School for an appeal of Graduate Faculty actions.

Item 21. Final Oral Examinations

All M.S. and Ph.D. graduate students must present a public seminar as part of their final oral examination. The final oral examination shall be conducted as outlined in the Graduate School Catalog.