

University of Washington  
Department of Bioengineering



# 2009-2010 Graduate Student Handbook

# University of Washington

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# Table of Contents

Foreword .....	5
<b>Section 1: Scholarly Conduct and Statement of Ethics</b> .....	<b>6</b>
Honor Code .....	7
<b>Section 2: Areas of Study in the Department of Bioengineering</b> .....	<b>9</b>
The Eight Research Focus Areas.....	9
Dual Degree in Bioengineering and Nanotechnology .....	9
Program on Technology Commercialization .....	9
Technology Entrepreneurship Certificate .....	10
Related Opportunities.....	10
<b>Section 3: The PhD Program</b> .....	<b>11</b>
Expected Prerequisites.....	11
General Requirements for the PhD Degree .....	11
Specific Course Requirements for the PhD Degree .....	12
Substitutions and Waivers .....	13
Credit Transfer .....	13
MD/PhD .....	13
Progression through the PhD Program.....	14
Communication .....	14
Grievances.....	14
Degree Timeline .....	14
First Year Advising and Satisfactory Progress .....	14
Research Advisor .....	16
Switching from PhD to MS.....	16
The Qualifying Examination.....	17
Qualifying Exam Committee.....	17
Qualifying Exam Process.....	17
Evaluation of the Qualifying Exam .....	19
The Supervisory Committee.....	21
The Student Plan .....	21
The General Examination .....	22
Form of the General Exam .....	22
Features Assessed in the General Exam.....	22
Process for General Examination .....	23
Admission to Candidacy for Doctoral Program .....	25
Dissertation.....	25
Reading Committee and Dissertation Defense.....	25
Dissertation Document Requirements.....	26
Graduation .....	27
Taking Leave of the Department .....	27
Pre-Qualifying Examination Flow Chart.....	28
Post-Qualifying Examination Flow Chart .....	29

<b>Section 4: The MS Degree</b> .....	<b>30</b>
BS/MS .....	30
MS BIOE.....	30
General Requirements for the MS Degree .....	30
Specific Course Requirements for the MS Degree .....	30
Switching from MS to PhD.....	31
Timeline and Progression through the MS Degree.....	32
Graduation .....	33
Taking Leave of the Department .....	33
MS Flowchart .....	34
<b>Section 5: The MME Degree</b> .....	<b>35</b>
Master of Medical Engineering .....	35
Admission .....	35
Graduate School Requirements.....	35
Continuous Registration.....	35
Grades.....	36
GNM Credit Limitation.....	36
Registration .....	36
Departmental Requirements .....	36
Petitions .....	37
Grievances.....	37
UW Services.....	37
Time to Graduation .....	37
Timeline and Progression through the Degree Program .....	37
Selection of Faculty Advisor .....	38
Thesis .....	38
Thesis Topic and Content .....	38
Supervisory Committee.....	39
Final Exam .....	39
Graduation .....	40
Taking Leave of the Department .....	40
<b>Section 6: Resources for all graduate students</b> .....	<b>41</b>

## Appendices

- **Appendix A: Expected Background and Prerequisites for the Graduate Program**
  - For students admitted Autumn 06 or later
  - For students admitted Autumn 01 – Autumn 05
- **Appendix B: Expected Background and Prerequisites Checklist**
  - For students admitted Autumn 01 – Autumn 05
- **Appendix C: PhD Planning Sheet**
  - For students admitted Autumn 06 or later
  - For students admitted Autumn 01 – Autumn 05
- **Appendix D: MS Planning Sheet**
  - For students admitted Autumn 06 or later
  - For students admitted Autumn 01 – Autumn 05
- **Appendix E: MME Planning Sheet (Non-Thesis Option)**
- **Appendix F: MME Planning Sheet (Thesis Option)**
- **Appendix G: Course Substitution/Waiver Request Form**
- **Appendix H: Satisfactory Progress/Scholarship**
- **Appendix I: Supervisory Committee**
- **Appendix J: Graduate Student Plan**
- **Appendix K: Request for General Exam**
- **Appendix L Request for Final Exam**
- **Human and Animal Subjects form**

## Foreword

Congratulations! You are entering one of the most satisfying and challenging phases of a scholar's career. Your undergraduate education has equipped you with solid knowledge, excellent skills, and good work attitudes. You will continue to develop and strengthen each of these in graduate school and throughout your professional life. The crucial tasks for graduate students are finishing formal course work, developing independent learning as a permanent skill and attitude, finding a "research identity", and defining and taking charge of their careers. Here is our advice on how to approach these important tasks.

### Adjusting to the nature of graduate school

We, the faculty, find that many of our incoming students incorrectly believe that graduate school is a continuation of undergraduate education. For most of you, your education to this point has consisted of taking the largest number of courses possible and maintaining the highest possible GPA. Your success in this task has resulted in your admission here. From now on, working for grades in courses is only relevant insofar as it allows you to maintain your progress as a student. Beyond our basic requirements, you should take courses to enhance your ability to perform your chosen research. Your goal in graduate school is to become an *independent researcher* by learning how to plan, perform, and interpret high quality research, and how to communicate the results in oral and written form. The skill, efficiency, enthusiasm and quality with which you accomplish these tasks will determine the future course of your scientific and technical career.

### Develop dual expertise in engineering and biology

Bioengineering is an interdisciplinary field that integrates the principles of physical science and engineering with those of biology and medicine. Because of the extraordinary complexity and redundancy in living systems, biological principles infuse new ideas and concepts into engineering. Conventional engineering notions of design and analysis take on novel meaning when seen from the point of view of biological components and systems. The forefront of bioengineering appreciates and deals with these intellectual issues.

The goal of the graduate program is to ensure that students become Engineering and Biological professionals by graduation. The educational philosophy of the Department of Bioengineering is simple: students should have *depth* (provided largely by the research experience) and *breadth* (provided both by course work and interaction with other faculty and students). While depth is common to all graduate programs, breadth is unusual in that it requires students to venture far beyond the confines of their own chosen research projects. The breadth requirement is primarily implemented by having students develop proficiency, skills and a broad range of knowledge from a set of core requirements.

### Get into the laboratory

The primary importance of laboratory research to graduate education in Bioengineering cannot be overemphasized. In undergraduate education you are taught what is known about a subject, whereas in graduate school you will learn how to discover things that are not yet known and invent things that have not been made. Only through performing research do you learn to create new knowledge and understand previously uncharacterized systems. The *process of discovery and innovation* inherent in research is an intense learning experience. It is quite difficult to design experiments that give meaningful, unambiguous answers. A typical PhD student spends a large amount of time wrestling with the design and accomplishment of experiments and the analysis of the resultant data. While this handbook focuses on the formal credit and examination requirements for the department, this should not obscure the expectation that you will do your primary learning in and around the laboratory with faculty, post-doctoral fellows and other students.

### Find a research advisor

You must take a *proactive* approach to the selection of an advisor. BIOEN 510, taken your first quarter in the program, will introduce you to important research in the Department. Another path to selection is through laboratory rotations. Working in a lab will bring you into direct contact with the advisor, the other investigators in the lab, and students and technicians. You learn intimately about the work of the lab as well as the way that the principal investigator in the lab guides the work of the staff. Another route to take is to meet with Bioengineering faculty. You can meet with several faculty whose work interests you and afterwards choose an advisor and possible project. This second technique provides greater breadth but much less depth of choice. The best technique is to combine the two suggestions above.

## Section 1: Scholarly Conduct and Statement of Ethics

One of the primary missions of the University is the creation and dissemination of knowledge. The University creates an environment in which research flourishes, and it depends on individuals to exercise the highest level of personal integrity in carrying out their scientific and scholarly activities. At the same time, the University is prepared, through the adoption of policies and procedures, to address lapses in scientific diligence and to pursue and resolve situations in which scientific and scholarly misconduct arise.

The University, consistent with federal regulations, assumes primary responsibility for investigating and resolving allegations of scientific and scholarly misconduct by its faculty, staff, and students. Federal requirements also pertain.

University rules (University Handbook, Volume III, Part III, Chapter 1: The Student Conduct Code at <http://www.washington.edu/students/handbook/conduct.html> and Volume II, Section 25-51A.5) define scientific and scholarly misconduct to include the following forms of inappropriate activities:

- Institutional misrepresentation of credentials
- Falsification of data
- Plagiarism
- Abuse of confidentiality
- Deliberate violation of regulations applicable to research

Students and faculty are reminded that these principles apply to all collegial interactions, including preparation for courses, course assignments, course examinations, and others such as term papers and the qualifying, general and final examinations.

The procedures for handling questions of misconduct require direct reporting to the Dean. The procedures attempt to safeguard both confidentiality and due process. The possible penalties include reprimand and dismissal of personnel at any level. Of the five types of misconduct listed, plagiarism appears to be the least well understood and is therefore discussed more explicitly in the following section on the Honor Code.

### Action item:

Each summer the School of Medicine organizes a series of lectures and small group discussions on the theme of Biomedical Research Integrity. Some training programs (including NIH) require their trainees to attend these sessions. The Department of Bioengineering does not otherwise require attendance but strongly encourages your participation. A clear sign of the value of these discussions is that most students, fellows and a significant number of our senior faculty attend. Details are online at <http://depts.washington.edu/uwbri/>

## Honor Code

The growth and development of Bioengineering is based on the scientific search for truth in all things. To foster the quest for truth and to be certain that proper credit is assigned to the work of colleagues, we establish the following Code of Honor:

1. Bioengineering seeks to find the principles that underlie biological phenomena, to alleviate human suffering and to prevent, diagnose and treat disease.
2. Bioengineering research is the work of individual researchers and research teams. Each member of a team will receive credit in proportion to his or her contribution to a project.
3. Students will be judged to a great extent on the merits of their research and are responsible to accurately represent their unique contributions to the academic community. The student's Advisor and Supervisory Committee are responsible for monitoring the student's work and will be given free access to records of work completed or in progress. They will meet regularly with the student to review progress. It is strongly recommended that each student document his or her progress daily in a laboratory notebook. Signed, dated and witnessed pages from such a notebook are often the sole criterion for judging scientific priority in academic disputes or for patent rights. Since the notebook can be considered as a legal document, conscious falsification of data in it is fraud and will not be tolerated. The same standards apply to all published work.
4. Credit for work done previously will be cited formally in homework, papers, proposals, student reports and those examinations that include formally written reports. Plagiarism, the unacknowledged use of the words, phrasing, or ideas of others, including oral communication, is totally unacceptable. Other people's writing or remarks must be put in quotation marks and referenced, and other people's ideas must be clearly cited.
5. Scholarship is an individual effort. Discussion and collaboration do augment scholarship and are encouraged, sometimes even in graded classroom and homework assignments. However, "collaboration" during examinations in the classroom is regarded as cheating, subject to the University's regulations.
6. Laboratory work should be carefully recorded in dated notebooks. Laboratory work is the responsibility of the researcher who undertakes a particular project. In the case of student research, the student's Advisor and Supervisory Committee accept responsibility to help the student to check his or her work thoroughly. In that spirit, students will keep precise records of laboratory work, records which are available to their Advisors and Supervisory Committees for review. Advisors and Supervisory Committees will meet regularly with students to review their progress.

The students and faculty of the Department of Bioengineering accept this Honor Code in a spirit of collaboration and quest for the truth.

I have read and understand the Bioengineering Honor Code and agree to uphold these principles. If I disobey these rules, I understand that I will suffer consequences, which may include dismissal from the Department.

I have read and understand the Bioengineering Honor Code and agree to uphold these principles. If I disobey these rules, I understand that I will suffer consequences, which may include dismissal from the Department.

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Name

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Date

## Section 2:

# Research Areas in the Department of Bioengineering

Research in the Department of Bioengineering is organized into eight focus areas. These areas maintain thematic coherence and help students understand the research that goes on in the laboratories of our diverse faculty. The focus areas are listed below. The departmental web site contains more detailed information about each focus area, including subspecialties, current research interests, and sample curricula. What should be clear from those descriptions is that *study within the Department can span more than one focus area*. Indeed, we encourage students to delve into more than a single area of study.

At the end of this section you will also find an introduction to the dual Degree in Bioengineering and Nanotechnology and two special certificate options, the Program on Technology Commercialization (PTC) and the Technology Entrepreneurship Certificate (TEC).

### The eight focus areas:

1. Bioinstrumentation
2. Biomaterials and Tissue Engineering
3. Global Health and Distributed Diagnosis and Home Healthcare (D2H2)
4. Imaging and Image-Guided Therapy
5. Integrative Physiology, Systems Biology & Synthetic Biology
6. Molecular Bioengineering
7. Neural Engineering, Rehabilitation & Augmentation
8. Understanding Nature Through Engineering

### Special opportunities for study

#### Dual degree in Bioengineering and Nanotechnology

The Center for Nanotechnology has launched the nation's first PhD program in nanotechnology, an undertaking designed to prepare students as leaders in a world in which scientific discovery and exploitation of nanoscale phenomena and the engineering of the very small will carry the next industrial revolution. The program puts in place a PhD nanotechnology track tied closely to other science and engineering disciplines. The effort is funded by the National Science Foundation's Integrative Graduate Education and Research Traineeship program. More information is available at <http://www.nano.washington.edu/education/index.html>

#### Program on Technology Commercialization (PTC)

NOTE: The PTC program will offer partial courses in the 2009-2010 academic year.

The Program on Technology Commercialization (PTC) is a three-course sequence designed to teach students the skills necessary to take a new technology or invention and protect it, analyze its potential, sell the idea to prospective licensees, senior management, or investors, and get the product to market. Students will learn business, legal, and other skills useful to their future careers in academia or industry.

Note that the 599 Technology Commercialization sequence must be taken in order; each course is prerequisite to its successor. More information is available at [http://icsl.ee.washington.edu/ptc\\_bioeng/index\\_ptc.html](http://icsl.ee.washington.edu/ptc_bioeng/index_ptc.html)

## Technology Entrepreneurship Certificate (TEC)

A key design element of the TEC program is the inclusion of both MBA and technology students in classroom and project-oriented settings. The program goal is to train science and engineering graduate students for careers in entrepreneurial settings or for intrapreneural positions in existing industry settings.

To earn the certificate, students must apply to the program by the deadline, filling out an application, completing an essay, and attaching a resume. TEC students need 18 credits of coursework, which will be spread over two years (at a minimum). More information is available at [http://bschool.washington.edu/cie/tec\\_certificate.shtml](http://bschool.washington.edu/cie/tec_certificate.shtml)

### Recommended Activities

- High-tech Entrepreneurship Speaker Series
- Entrepreneurship and Innovation Club Active Member
- Participate in the Business Plan Competition

## Additional related opportunities:

Molecular Medicine certificate:

<http://depts.washington.edu/molmed/index.html>

Global Health certificate:

[http://depts.washington.edu/deptgh/students\\_programs/cert\\_grad.php](http://depts.washington.edu/deptgh/students_programs/cert_grad.php)

Center for Advanced Study and Research on Intellectual Property:

<http://www.law.washington.edu/Casrip/>

## Section 3: The PhD Program

The doctoral degree is the highest degree that can be awarded to a student. Attainment of this degree demonstrates high achievement in the field of Bioengineering, including excellence and intellectual leadership as an independent scientific researcher. A student seeking the PhD in our department undertakes a rigorous set of courses (see below) and a focused research project. Three major milestones punctuate that work: the Qualifying Examination, the General Examination, and the Final Exam (Dissertation Defense). For students entering Autumn 2006 or later, a teaching experience is required.

The goal of our graduate program is to prepare bioengineers for careers in industry and the academy. Our objectives are:

1. To provide bioengineers with an in-depth understanding of mathematics, engineering principles, physics, chemistry, and molecular, cellular, and organ system physiology and biology.
2. To train bioengineers to apply basic sciences to medical and biological problems, using engineering principles.
3. To train bioengineers to recognize and provide engineering solutions to clinical problems.
4. To train students to do bioengineering research.
5. To train students to teach bioengineering at the graduate and undergraduate level.
6. To train students to apply bioengineering research to commercially viable problems.

Not all students need to be trained in all areas.

### Expected Prerequisites

Every graduate student is expected to have significant knowledge of the following topics prior to entering the graduate program:

- Algebra, linear algebra, trigonometry
- Ordinary differential equations
- Signal analysis
- Probability theory and statistics
- Programming
- Electrical engineering and physics
- Chemistry (organic, inorganic, biochemistry)
- Material science
- Rate processes and mathematics
- Cellular biology

Well qualified students may be admitted to the graduate program missing some background knowledge, however, they will be responsible for learning these topics prior to program entrance.

### General Requirements for the PhD Degree

Refer to the Graduate School web site at <http://www.grad.washington.edu>. Select "Resources for Graduate Students," then "Instructions and Procedures."

Please note that you must earn a 2.7 or higher in all required courses and maintain a 3.0 overall GPA. Grades below 2.7 count into your cumulative GPA even though the credits cannot be counted toward your degree. All required courses must be taken for a numerical grade. All requirements for the PhD must be completed within 10 years.

## Specific Course Requirements for the PhD Degree

### *The following requirements apply to students who entered Autumn 2006 and later:*

To keep track of your coursework, please see the PhD Planning Sheet, **Appendix C**. The degree requires 33 course credits. Petitions are not encouraged, though students who enter with an Engineering Master's degree may petition to transfer up to 6 of their previous Master's credits toward the 16 elective credits requirement.

- BIOEN 501: Molecular Bioengineering (4 credits)
- BIOEN 502: Cellular Bioengineering (4 credits)
- BIOEN 503: Systems Bioengineering (4 credits)
- BIOEN 510: Introduction to Bioengineering (1 credit)
- 4 credits of Biostatistics: BIOST 511, 517, 521 or 524
- 16 credits of research-related electives selected in consultation with the faculty advisor. At least one course must be at the graduate level.

Additionally, students will complete 1-3 laboratory rotations and 1 Teaching Assistantship. The laboratory rotations occur during the first year of the PhD degree. The Teaching Assistantship can be completed at any point during the PhD degree but is encouraged to be undertaken after the second year.

### *The following requirements apply to students who entered Autumn 2001- Autumn 2005:*

To keep track of your coursework, please see the PhD Planning Sheet, **Appendix C**. The degree requires 46 course credits. Petitions are encouraged with the approval of your research advisor (see **Appendix G**).

- 8 credits of Bioengineering Principles of Physiology: BIOEN 588 & 589
- 4 credits of Advanced Instrumentation: BIOEN 581
- 3 credits of Biotransport: BIOEN 550
- 3 credits of Introduction to Bioengineering: BIOEN 510
- 4 credits of Biostatistics: BIOST 511 or BIOEN 541
- 3-5 credits of Biochemistry or Cell Biology. Choose from:
  - BIOC 405, 406, 440, 441, 442, 530
  - BIOL 401, 402
  - CONJ 531, 532, 533 (1.5 credits each, offered sequentially during autumn quarter; must take at least two of the three)
  - MCB 511
  - MICROM 410, 431
- 8 credits of Engineering Breadth. Choose from:
  - BIOEN 540, 552, 568
  - Graduate engineering courses from other engineering departments (this excludes Technical Communications courses and courses joint-listed with Bioengineering)
- 12 credits constituting an in-depth sequence in a thrust area (see Section 2 for descriptions).

## Substitutions and Waivers (applies only to students who entered prior to Autumn 2006)

Request a *waiver* when you wish to be exempted from a core requirement on the basis of previous training or experience (see **Appendix G** for the waiver/substitution/petition form). For example, if you come into our graduate program after taking a series of senior physiology courses, you might request to waive the two physiology courses in the core curriculum. Note that waivers do not reduce the total number of required credits for the degree; they simply free credits for electives.

Courses taken in a prior MS degree may introduce more flexibility into the Bioengineering program. If the prior degree covers some of our PhD requirements, the student would be able to take other courses, either to gain depth in the chosen area or to explore another field. The student and the faculty advisor should plan such variations from the standard curriculum. Under some conditions the total number of credits required for the PhD may be reduced; normally, however, students will be expected to explore and further their research capabilities via substitute course work. Petitions consisting solely of courses below the senior/400-level will not be reviewed.

Request a *substitution* (see **Appendix G** for the waiver/substitution/petition form) when you seek approval to substitute another course for a core requirement. For example, if you are a student with a strong interest in zoology, you might request to substitute the Zoology Department's course in physiology for Bioengineering's core physiology requirement. Such requests should present a compelling educational reason for the substitution and must have the faculty advisor's approval. Petitions consisting solely of courses below the senior/400-level will not be reviewed.

Petitions, waivers, and substitutions should be submitted to the Senior Academic Counselor as soon as possible. **NOTE: Instructor review and approval is required for petitions involving Biotransport and/or Medical Measurements and/or Bioengineering Physiology I and/or II.**

## MD/PhD

The Department of Bioengineering participates in the MD/PhD program, administered by the Medical Scientist Training Program (MSTP). Students who wish to follow this path must complete a combined application through MSTP.

MSTP students start their PhD work with a lab rotation during the summer immediately prior to starting medical school. In September they enter medical school with their class. During the second summer they do another lab rotation (PhD credit), then proceed to the second year of medical school. At the end of the second year they pass Part 1 of the National Board Exams. That summer they can either do a third lab rotation or enter the graduate program. After completing their PhD, they return to the final 2 years of medical school (clinical rotations).

The following rules and principles apply:

1. Neither the MD nor PhD requirements are reduced from the normal requirements.
2. Any reduction in total credits required would be made by special request to and review by the Student Affairs and/or Curriculum Committee.
3. Credits for the normal MD program cannot be used as credits for the PhD program, in accordance with the University's rule against double-counting credits. However, while completing the MD portion of the program, a student may be able to fit in other graduate credits, for example, thesis research.
4. The PhD component of the combined program can be accomplished in three years, for a total program of seven years. Early definition of the thesis program is strongly encouraged. Mechanisms include using the summer before starting Medical School and the summers after the first and second years for research. The Medical School requires using these three summers for the laboratory program.

5. The Qualifying Examination should be taken as early as possible during the program, and not later than 2.5 years after entering the combined program.

## Progression through the PhD Program

Students in the Department of Bioengineering are responsible for planning programs of study and research that lead to timely degree completion. Students are *assisted in the planning process* by faculty advisors, Supervisory Committees, the Senior Academic Counselor, and the Student Affairs Committee. Degree planning is done at three times: when the student is admitted, when a Supervisory Committee is formed, and when the Student Affairs Committee approves a Student Plan. In addition, the student's Supervisory Committee must conduct annual reviews of student progress.

## Communication

The Department is committed to the success of each student. The Senior Academic Counselor is available to assist students with department policies and degree requirements. The Senior Academic Counselor is also available to help with problems (personal, academic, research/professional) that interfere with degree and/or research progress, as are the Lead Counselor, Vice-Chair, and your Faculty Advisor. *When you encounter a problem, please contact us without delay.*

## Grievances

Students are encouraged to speak first with the Senior Academic Counselor. *Together the student and Counselor will work to find a positive solution.* If the student feels a suitable solution has not been found, the student may submit a petition to the Student Affairs Committee. In all cases the student has the option of following the Graduate School's grievance guidelines: <http://www.grad.washington.edu/area/grievances.htm>

## Degree Timeline

Ordinarily a student progressing well and on schedule will:

- **1st year:** include one to three lab rotations (and complete a one-page, faculty-reviewed document of work accomplished at the end of each rotation) and select a thesis advisor in Winter quarter but no later than the end of Spring Quarter.
- **2nd year:** pass the Qualifying Exam, fill out a Graduate Student Plan (see **Appendix J**), and form a Supervisory Committee by the end of the second year.
- **3rd year:** pass the General Exam.
- **4th (and subsequent) year(s):** make an annual progress report to and receive feedback from the Supervisory Committee.
- **5th year:** defend the dissertation.

*The sooner you begin research, the sooner you are likely to obtain your PhD degree.* It is a Graduate School policy that all requirements for the PhD be completed within 10 years.

## First Year Advising and Satisfactory Progress

All entering students are assigned a first year faculty advisor. The student should meet with the first year advisor prior to the beginning of Autumn, Winter, and Spring quarters. Students should choose their permanent research advisor in Winter quarter, but no later than the end of Spring Quarter. This person serves as the permanent faculty advisor.

Prior to Autumn quarter, the student and first year faculty advisor should discuss:

- **Expected Background Knowledge**

Are any expected background topics missing from the student's record? If so, how will the student get up to speed?

- **Autumn Quarter Courses**

BIOEN 510, Bioengineering Seminar, is required.

BIOEN 501, Molecular Bioengineering, is required.

Students should begin lab rotations by registering for BIOEN 599A, which requires a faculty code.

(Faculty codes are listed on the Department's administrative home page:

<http://www.bioeng.washington.edu/home/geninfo/GenInfoIndex.htm>). The remainder of the schedule should consist of approved elective or other degree-related courses.

- To **plan ahead for subsequent quarters**, please consult the department's Master Teaching Schedule (MTS). This schedule shows which courses will be taught each quarter for the next two academic years. The MTS is available at [http://depts.washington.edu/bioe/education/educ\\_annual.html](http://depts.washington.edu/bioe/education/educ_annual.html).

- **The Student's Research Interests**

First year advisors should help students clarify their research interests and should suggest faculty labs for rotations and identify advanced students who could serve as resources. In combination with BIOEN 510, these **advising conversations** should enable students to choose a research lab within a quarter or two. Students should also use other resources for exploring research, including the departmental web site, the "bioegrad" email list; lab rotations; interviews with faculty; and the Departmental Seminar in Winter and Spring quarters.

- **Satisfactory Progress in the First Year**

To make satisfactory progress in the first year, students must:

1. Discuss their educational plans with the first-year advisor before Autumn, Winter, and Spring quarters;
2. Secure a research supervisor from the Core or Adjunct faculty list by June;
3. Register for at least 10 credits per quarter to maintain eligibility for any Research Assistantship or Teaching Assistantship;
4. Register for courses that apply to the Bioengineering degree (exceptions should have the advisor's concurrence);
5. Make progress on required core courses;
6. Complete courses with a minimum 2.7 GPA per course, and keep the cumulative GPA above 3.0.

**Note:** *The first major milestone for PhD students is the Qualifying Exam, to be taken during the second year. Please plan ahead by reading the section on the Qualifying Exam in this handbook.*

- **Satisfactory Progress beyond the First Year**

To maintain satisfactory progress after the first year, students must:

7. For students who entered prior to Autumn 2006: Successfully complete all Expected Background courses and submit checklist prior to Qualifying Exam;
8. Successfully complete the Qualifying Exam by June of the 2<sup>nd</sup> year;

9. Establish the Supervisory Committee no later than one quarter after the Qualifying Exam, and no less than 4 months before the General Exam;
10. Register for at least 10 credits per quarter to maintain eligibility for any Research Assistantship, Teaching Assistantship, or Fellowship (2 credits in Summer);
11. Register for courses that apply to the Bioengineering degree (exceptions should have the advisor's concurrence);
12. Have a core or adjunct research advisor at all times;
13. Fill out and turn in **Appendix J, and C or D** (degree planning sheets) to the Senior Academic Counselor within 12 months of completing the Qualifying Exam and at least one quarter prior to the General Exam;
14. Complete courses with minimum 2.7, and keep the cumulative GPA above 3.0;
15. Meet with the Supervisory Committee as a whole at least once per year.

***If you do not maintain satisfactory progress, you may be asked to leave the department.***

It is recommended, though not mandatory, that you:

- Complete the General Exam by the end of the 3<sup>rd</sup> year;
- Complete the Final Exam by the end of the 5<sup>th</sup> year.

## **Research Advisor**

When a student decides to work in a specific laboratory, he or she selects a particular faculty member as a research advisor. The research supervisor assumes primary responsibility for future direction of the student and will ultimately direct the student's dissertation. As soon as a research advisor is chosen, the student notifies the Senior Academic Counselor and informs the first year advisor. Students must ***choose a research advisor from the Core or Adjunct Faculty lists***. Exceptions must be petitioned to the Student Affairs Committee.

**NOTE:** If a student chooses an Adjunct Faculty advisor, the Supervisory Committee must be established concurrently and meet within three months.

## **Switching from PhD to MS**

Any student who wishes to transfer from a doctoral to a master's degree program must submit a formal request to the Student Affairs Committee with a written note (or e-mail) from their advisor stating approval of this action, via the Senior Academic Counselor. If approved, the student will follow the requirements for the MS (see **Section 4**), including submitting a Graduate Student Plan for approval (**Appendix J**).

## The Qualifying Examination

The Qualifying Examination is the first test, after admission, of a Bioengineering student's potential for a successful career in original bioengineering research at the doctoral level. The Exam must be taken before the end of the second year (Spring Quarter); failure to complete the Qualifying Exam on time will result in academic probation. (See **Appendix H** for a discussion of probation.) There are **NO** exemptions from the qualifying exam – students cannot waive this requirement. Students are asked to plan ahead as coordinating faculty schedules may be difficult. On occasion unavailability of the faculty may require a delay of examination; in this case, a student may submit a petition to the Academic Counselor for a delay of no more than one quarter.

During this exam a subset of the faculty assesses the student's knowledge, background on expected prerequisites, ability to do focused work, oral and written communication skills, common sense, and potential as a researcher. The exam determines whether the student should continue in the doctoral program. Students must pass the Qualifying Examination, on either their first or second try, to remain in the PhD program.

The Examination has both *written and oral components*. *The Examination has both written and oral components*. The written Examination format and content will include the following (without usual limitations imposed by budgets, personnel, precise timing, space, etc.):

- ~ 1 page for specific aims,
- 2-3 pages for background and significance,
- 13-16 pages for research design and methods.
- References (page number unlimited)

*The criteria for the written Examination will be those set forth in George Eaves' article Preparation of the Research-Grant Application: Opportunities and Pitfalls (1984). This document is available on the Administrative Homepage (<http://www.bioeng.washington.edu/home>).*

The oral portion of the Examination tests the student's oral communication skills, the depth of the student's knowledge of the chosen topic, as well as the breadth of his or her knowledge of Bioengineering as a discipline. The *oral examination has three parts*. In the first part, which is open to the public, the student has approximately fifty minutes to present his or her work. Questions from the Committee during this portion will be limited to points of clarification. The presentation is followed by an open question-and-answer period, after which the audience is dismissed. The Committee may then question the student broadly. The length of the closed portion of the oral exam is not specified, but is generally about one hour.

## Establishing a Qualifying Exam Committee

This examination is administered by a Qualifying Examination Committee consisting of four faculty, one of whom is the student's research advisor. The **process for assembling the committee** is as follows:

- The student, consulting with the research advisor, compiles a list of six candidates (not including the research advisor), *three* of whom have primary appointments in Bioengineering. The student contacts the six proposed faculty and requests their willingness to serve.
- The student requests the appointment of a qualifying committee. To do so, the student submits to the Academic Counselor 1) the names, departments, e-mail addresses, and box numbers of the proposed examiners, 2) the student's current CV and 3) statement of research interests.
- The Student Affairs Committee selects three faculty members from the list. These members, plus the research advisor, constitute the committee. *Two* of the members, including the Chair, must have primary appointments in Bioengineering. The research advisor may not chair the committee and will be a non-voting committee member. The Student Affairs Committee formally establishes the Examination Committee and notifies the student and the committee via e-mail.

## Qualifying Exam Process

The Qualifying Exam Committee will meet within one month of the initial appointment, and ideally no less than one week before the anticipated beginning of the student's preparation of the written portion of the exam. The student arranges this **initial meeting**, but does not attend the discussions that lead to formulation of questions. At this first meeting (usually scheduled for one hour), committee members assess the student's progress based on the academic record, a brief presentation by the student of his or her research project, and other information provided by the research advisor and/or the student.

- The student ascertains that committee members are available during the desired exam time frame. The student sets the committee meeting dates, first checking to see that all members can attend on these dates.
- The student and the committee choose an **examination date**, allowing at least two hours for the exam, public questioning, and closed questioning. Qualifying Exams should not be scheduled during the final two weeks of fall quarter. This will allow adequate time for a student to resubmit a written exam (see below) without conflicts due to the December holiday break. *Students are encouraged not to schedule a vacation immediately after the exam in case of resubmission.* Exams should not be scheduled on the morning of the 2<sup>nd</sup> Tuesday of each month to avoid conflict with faculty meetings. Exams must be held on the UW main campus to allow all Bioengineering faculty, staff, and students the opportunity to attend.
- The student schedules an exam room on the UW main campus. Room scheduling details are available on the Administrative Homepage (<http://www.bioeng.washington.edu/home>).
- **No later than** the last day of the month prior to the month of the exam, the student emails the Academic Counselor with the type of exam, title, date, time and location, advisor name, and names of all committee members, making sure to indicate the Chair. Exam information will be emailed to the BIOE community at the beginning of the month.
- The student prints the exam evaluation forms from the administrative website and brings them to the exam.

During or after the first meeting, each exam committee member, other than the student's advisor, submits one or two questions to the chair; the full committee must approve the full set of questions, which should meet the following criteria:

- The topics for the questions will have minimal direct overlap with the student's probable PhD research, but will be within the student's thrust area.
- The questions will focus on areas of current scientific and/or engineering interest that will complement the student's existing body of knowledge.

The chair submits the approved **questions** to the student *five weeks* before the date for the oral part of the exam. The intent is that the student spends one to two weeks doing library research before beginning to write the proposal. The student may consult with all sources, including other students and faculty, except the committee members, and may review previous examinations and grant applications if they are available. Exam committee members may be consulted only for clarification of the questions themselves.

*Four weeks* after being given the questions, the student submits the **written document** to all committee members for their review. *One week* after the committee members have received the written document, the **oral examination** will be held.

*If the student becomes ill:*

The Qualifying Exam is completed over a 5-week period and is designed to evaluate a student's scientific knowledge, research and presentation skills, creativity, and time management. If a student becomes seriously ill, the student immediately contacts the Academic Counselor and the Qualifying Exam Committee chair. A

doctor's note is then presented to the Academic Counselor. The note need not disclose the illness, only the amount of recovery time necessary. The note will be used as the basis for further action to be decided by the Committee chair. In case of other emergencies, the student should immediately contact the Academic Counselor and the Committee chair.

*If a committee member cannot continue his or her duties:*

When establishing Qualifying Exam committees, the Vice-Chair will designate the QE chair and a 'spare'. The 'spare' will assume QE chair duties in situations where the QE chair must excuse him- or herself. If a committee member cannot continue, the Academic Counselor and the Committee chair should be notified as soon as possible. The Academic Counselor will contact a replacement faculty member from the original list of 6 faculty submitted by the student to establish the committee. In the event that a committee member should unexpectedly not attend an exam, the Committee chair may ask the student to reschedule or the Committee chair may momentarily adjourn the exam until a suitable replacement faculty member is found. If none can be found, the student must reschedule the exam.

## Evaluation of the Qualifying Exam

The student prints the exam evaluation forms from the administrative web site prior to the exam (<http://www.bioeng.washington.edu/home>) and brings them to the Chair at the exam.

At the close of the oral exam questioning, the chair dismisses the student and the committee grades the examination.

The exam will be evaluated in four specific areas:

1. Scientific merit of the written and oral presentations of the proposal.
2. General knowledge and reasoning ability as demonstrated in the question/answer session.
3. Presentation (quality of oral and written presentation, style, organization, clarity, etc.).
4. Knowledge and understanding of expected prerequisites.

Each area will be scored as Excellent, Good, Fair, or Poor.

- **Excellent:** reserved for a truly outstanding performance
- **Good:** clear competence in the given area
- **Fair:** some weaknesses worthy of corrective action were noted
- **Poor:** unacceptable performance for which no simple corrective action is deemed likely to raise the performance to the "good" category.

The voting members of the committee will record their 4 scores of the performance of the candidate separately, qualitatively discuss the student's performance, then pool their final scores to produce one set of 4 scores on which the majority of the committee members agrees. No intermediate scores will be permitted. In cases in which the voting members of the committee cannot reach unanimity on a score after the discussion period, the chair will record an intermediate score, or the higher score, as appropriate. At the close of this portion of the exam all grades are considered final. It is suggested that the research advisor serve as the session reporter to record comments and recommendations during the exam session.

Based on the exam committee's final scores, one of the following actions is required:

1. **Pass:** "Good" or "Excellent" performance in all areas.
2. **Conditional pass:** If the student received an evaluation of "Fair" on one or more sections of the exam; the committee has identified some specific weaknesses that need to be addressed. The committee will require specific actions to remedy these weaknesses. The assignment of a conditional pass constitutes a contract between the student and Department to fulfill the conditions. The recommendations will be noted in the qualifying exam report. Any conditions set must be completed satisfactorily before the student will be permitted to take the General Examination.

3. **Resubmission:** This is a specific case of conditional pass invoked when the written proposal has merit but contains fundamental weaknesses, which were not adequately addressed in the subsequent oral presentation. Additional work is needed before the written proposal is acceptable. The student will receive a critique of the written proposal, and will have three weeks to revise and resubmit the proposal to the exam committee. By the end of the first week, it is recommended that the committee communicate clear expectations and answer any clarification questions. At the committee's discretion, a follow-up oral presentation may be required at the end of the three-week period. This follow-up oral presentation will not be open to the general public. The committee must then grade the resubmitted exam as either a Pass, Conditional pass, or Fail within one week of receipt (no further revision/resubmission will be permitted) and notify the Senior Academic Counselor. Note: a resubmission does not guarantee a subsequent pass or conditional pass!
4. **Fail:** If a student receives a "Poor" evaluation in two or more categories the student fails the exam. The student can repeat the examination one time, no less than 6 months and no more than 12 months after the first time, and may propose a new Examination Committee for the second attempt. If the student does not re-take the exam within 12 months after the first examination date, he or she is automatically terminated from the program. If a student fails the Qualifying Examination on the second attempt, the full faculty decides whether the student will be offered a transfer to the master's degree or be asked to leave the Bioengineering program.

If the examination is being taken for the second time, the committee has only options 1, 2, and 4.

Immediately after the exam, the chair informs the student orally of the committee's decision. All committee members will then make themselves available for 1-hour discussions of the examination with the student at the student's discretion within one week of the exam, but preferably within two days. Within one week, the chair will write the student a letter summarizing the committee's findings. The Senior Academic Counselor also receives copies of the letter and the written evaluations for the student's file. It is the Chair's responsibility to send the letter and forms to the Senior Academic Counselor no later than one month after the exam.

## The Supervisory Committee

The Supervisory Committee reviews academic performance and sees that the student progresses in accordance with the guidelines of both the Graduate School and the Student Affairs Committee. **Students should schedule annual meetings to receive feedback on research and degree progress.** The Supervisory Committee also administers and assesses the General and Final Examinations (described below).

- No later than one quarter following successful completion of the Qualifying Exam (and a minimum of 4 months before the General Exam), the student, in consultation with the research advisor, assembles a Supervisory Committee, which the research advisor will chair.
- The Supervisory Committee consists of a minimum of four members, including the research advisor, who will chair the committee, and a Graduate School Representative. At least two members of the Supervisory Committee must be members of the core Bioengineering faculty. A majority of the members must hold Graduate Faculty status, and any member without Graduate Faculty status may not serve as chairperson or Graduate School Representative. Check Graduate Faculty status at <http://www.grad.washington.edu/gradfac>.
- *The student is responsible for securing a Graduate School Representative (GSR). The GSR is proposed to the Graduate School by the Graduate Program Coordinator in the student's degree-offering unit and must be a member of the Graduate Faculty. Endorsed Graduate Faculty may accept unlimited GSR appointments.*

*Faculty members with Primary, Joint, Adjunct, or Affiliate appointments in other departments, who have Graduate Faculty Status, are eligible to serve as GSR; however, it is vital that a conflict of interest in the selection of the GSR be avoided. Budgetary relationships, personal relationships, or research and/or publication relationships between the GSR and either the student or the committee chair are examples of possible conflicts of interest. Faculty members with Primary, Joint, Adjunct or Affiliate appointments in the student's degree-offering unit or the committee chair's department are **not** eligible to serve as the GSR, as this is also considered a conflict of interest.*

**The GSR is responsible for ensuring that no such conflicts of interest or appearance of conflicts of interest exist and must attest to this upon request.** For more information, please visit the following website: <http://www.grad.washington.edu/policies/memoranda/memo13.shtml>

- To establish a Supervisory Committee, the student submits **Appendix I** (see the back of this Handbook) and the **Human and Animal Care Certification Form** (last appendix in this handbook or online at <http://www.grad.washington.edu/forms>) to the Academic Counselor. The Graduate Program Coordinator then requests the committee from the Graduate School.

## The Student Plan

- No later than one quarter after the Supervisory Committee is formed, the student meets with the committee to prepare and complete a Graduate Student Plan (see **Appendix J**). The student then submits the plan, signed by the committee, to the Academic Counselor. The Student Affairs Committee reviews the plan and gives final approval. Students are encouraged to submit the Plan as soon as all courses are completed. **All required courses must be completed prior to the General Exam.** An approved Student Plan must be on file with the Academic Counselor before the General Exam is taken.

## The General Examination

The General Examination is used to determine the soundness, significance, and originality of the student's research project, as well as test the clarity and thoroughness of the student's understanding. It provides an opportunity for the student to justify his/her research vision, describe the initial experimental plan, and present preliminary data demonstrating feasibility of the project. The General Examination affords an opportunity to correct deficiencies in the student's overall educational program that become evident during the course of the exam. Passing the examination advances the student to PhC or doctoral candidacy status.

*The General Examination should be performed no less than three quarters before the Final Examination, but it is strongly advised that it be scheduled as early as possible, preferably about one year after passing the Qualifying Examination.* It is expected that by the time of the examination the student will have performed sufficient preliminary work to allow the Supervisory Committee to assess the likelihood of successful completion of the proposed PhD. An approved Student Plan must be on file no later than the quarter before the exam.

## Form of the General Examination

The General Examination has both written and oral components whose topics are the student's plan of research. It is expected that if no major changes occur in the direction of the student's research, parts of the written portion could eventually function as the introduction to the dissertation. The faculty value something that is both concise and complete. The written examination should give the reader a good understanding of why and how the research project is to be undertaken. A format for both the written and oral examinations that has proven very successful is the following:

- Brief summary of the dissertation plan
- Review of the pertinent literature
- Summary of work performed up to that point by the student
- Evaluation of the key issues to be addressed in future work
- Detailed plan of work for the remainder of the dissertation

Students should confer with their research supervisors about the appropriate weighting of each section.

Note that to be able to complete the last two items, it is necessary to have a clear view of the issues to be addressed in the dissertation. Furthermore, if the direction of the dissertation is not in sharp focus at the time of the examination, it is difficult for the committee members to accurately assess the student's readiness to proceed. For these reasons we strongly advise students to confer directly with all their committee members about the direction of their dissertation prior to commencing the written portion of the Examination. Regular Supervisory Committee meetings will have been useful preparation. Continued conferral with faculty and fellow students about scientific issues during the preparation of the document is expected, but the text must be written in the student's own words.

## Features Assessed in the General Exam

- Scientific and scholarly quality.
  - Does the scientific proposal lead to the testing of an important hypothesis?
  - Originality and novelty; a new contribution to the field; opening of a new approach or a new field.
  - Inspiration for new experiments.
  - Integration of facts, knowledge, and principles fundamental to a field or topic. Understanding of the salient background in the field and its significance.
  - Adequacy and suitability of methods, quality of data, and depth and perception in analysis.
  - Adequacy of data and analysis with respect to justifying the conclusions drawn.
- Written Presentation.
  - Writing: Is it clear, concise, and in good English? Is sentence and paragraph structure sound?
  - References: Are more used than necessary? Have key references been omitted? Are all statements suitable and compatible with the source?

- Data: Are any text, figures, and/or tables duplicated? Are data presented clearly, succinctly, and in logical order?
  - Units of measure, abbreviations, symbols: Are there misuses of these? Are units standard and internally consistent? Are units given for all parameters and variables used in equations?
  - Tables: Can they be simplified or condensed?
  - Figures: Are they sharp and contrast with lettering proportionate to size of the figure? Are there legends? Are they simple yet clear and complete enough to allow understanding? Are units correct?
  - Titles: Should be specific, with no superfluous or unnecessary words. A total of 85 letters and spaces are permitted in a title. Such expressions as "Studies on...," "Further investigations of...," "Observations on...," and "Preliminary observations" are forbidden.
  - Abstract: Should be approximately 150 to 250 "standard" words in length; stated concisely in a single paragraph.
- Oral presentation
    - Were the evidence and arguments logically organized and convincing?
    - Is the presentation clear, logical and professional?
    - Is the science presented at a level showing good quality and depth, demonstrating the presenter's thorough understanding of the topic?
    - Are answers to the questions thoughtful, direct, and to the point.
    - Where information is lacking can the presenter devise a strategy for gaining the information?
    - Are the slides well constructed for clear visualization of the science?
  - NIH "Guiding principles for research involving animals and human beings."
    - All issues are addressed and requirements prepared as if they will be submitted to the appropriate UW Committee.
  - Ethics
    - Was there any question of fraud, misrepresentation, misquotation, plagiarism or deliberate or even thoughtless falsification of data?

## Process for General Examination

- The student's Supervisory Committee administers the General Examination.
- Registration as a graduate student is required the quarter the exam is taken and candidacy is conferred.
- Using the General Exam request form (**Appendix K** in the Handbook Appendix), obtain exam request approval from ALL committee members. All members must approve of the request, including those who cannot attend. Email approval is sufficient but the email must be printed and attached to the request. The request must be received by the Academic Counselor no less than **3 weeks prior** to the exam date. An exam may not be held if the student has not submitted a signed Request for General Exam form within the proper timeframe.
- Also at least **3 weeks prior** to the exam date, the student must submit the online exam request at <http://www.grad.washington.edu/mygrad/student.htm>
- The Request will be approved if the student has completed any work required as a condition of passing the Qualifying Examination and if the Student Affairs Committee has approved an official Student Plan. An approved Student Plan must be on file no later than the quarter before the exam. All core Bioengineering courses must be completed before the General Examination, and the student must have at least 18 graded credits at the 500-level.

- Scheduling the General Examination at a time when all Supervisory Committee members are available is the responsibility of the student. All exams must be held on the UW main campus to allow all departmental faculty, staff, and students the opportunity to attend. Exams should not be scheduled during the morning of the 2<sup>nd</sup> Tuesday of each month when faculty meetings are held.
- The student schedules an exam room on the UW main campus. Bioengineering rooms may be scheduled online from the Administrative Homepage (<http://www.bioeng.washington.edu/home>).
- **No later than** the last day of the month prior to the month of the exam, the student e-mails the Academic Counselor with the type of exam, title, date, time and location, advisor name, and names of all committee members, making sure to indicate the Chair. Exam information will be emailed to the BIOE community at the beginning of the month.
- The written document is submitted to all members of the Supervisory Committee no less than **one week before** the Oral Examination. In preparation for the Oral Examination, the student may consult with anyone but may not practice before his or her Advisor or any other member of the Supervisory Committee.
- Approval of the request for General Examination generates a warrant, which the Academic Counselor will give to the student about **three days** before the exam. The student picks up the warrant and takes it to the oral portion of the exam.
- During the oral examination, the chairperson, the Graduate School Representative, and at least two additional examining committee members (one of whom must have Graduate Faculty status) must be present.
- During the quarter the General Examination is taken, a student is eligible to enroll in BIOEN 800. **The PhD requires 27 credits of BIOEN 800, completed over at least three quarters between the General and Final Examinations.**

The Oral Examination lasts approximately 2 hours. In the first 30-40 minutes, which are open to interested members of the public, the student presents his or her research plan. Questions by the committee during this portion will typically be limited to points of clarification. A question and answer period ensues, after which all but the committee and the student are dismissed. The student then answers questions from the committee. At the end of the examination the chair dismisses the student and the committee discusses and votes on the student's performance. If the General Examination has been taken only once, the Committee has four options:

1. it can pass the student;
2. it can pass the student under the condition that some remedial action be taken within a specified time;
3. it can fail the student and advise him or her to retake the Examination only after completing some remedial action;
4. it can fail the student.

If the examination is failed the committee is free to require repeating any or all sections of the General Examination, after any required tasks and after any specified time. The Supervisory Committee may recommend that the Dean of the Graduate School permit one reexamination, after further period of study. Any members of the committee who do not agree with the majority opinion are encouraged to submit a minority report to the Dean of the Graduate School. If the Examination has already been failed once, the committee has only options 1, 2, and 4.

The student's research advisor (and any other committee members who wish to) will discuss the outcome of the examination and the deliberations of the committee with the student in a private meeting as soon as possible after the examination. Shortly afterwards the advisor will draft a letter detailing the results of the examination, to be sent to the student with copies to the Supervisory Committee members and the Academic Counselor. This letter will be placed in the student's permanent file. The **warrant must be signed** by all committee members and

returned to the Academic Counselor, who will inform the Graduate School and place a copy in the student's file. The signed warrant notifies the Graduate School of the student's new status as PhC.

## Admission to Candidacy for Doctoral Degree

Thereafter, the student is identified and designated as a Candidate for the appropriate doctoral degree and is awarded the Candidate's Certificate. Candidacy is conferred on the last day of a quarter; the Graduations and Academic Records office issues certificates approximately four months later. After achieving Candidate status, the student ordinarily devotes his or her time primarily to the completion of research, writing of the dissertation, and preparation for the Final Examination.

The Candidate Certificate and the doctoral degree may not be awarded the same quarter.

## Dissertation

The doctoral dissertation is a document that demonstrates that its author has completed an original and independent investigation of a significant problem. The dissertation reflects the student's competence to deal with a significant research problem, to understand its position in the field of bioengineering, to glean significant information from the work done and to master the techniques necessary to extract, interpret and use the data that come from the work. The dissertation provides evidence that the student can recognize an important problem, acquire the data to answer the questions posed within that problem, and extend the results of the answered questions to other problems of significance.

- The Graduate School's Style and Policy Manual for Theses and Dissertations outlines format requirements. It is available on-line at: <http://www.grad.washington.edu/students/thesis-dissertation/index.shtml>. Students are required to submit a draft of the dissertation to the Graduate School thesis adviser for the Preliminary Review. See to submit certain pages of the dissertation to the Graduate School's thesis adviser for the Preliminary Review. See <http://www.grad.washington.edu/students/thesis-dissertation/preliminary-review.shtml>. The **Preliminary Review is required** prior to final dissertation submission.

## Reading Committee and Dissertation Defense

Defense of the doctoral dissertation, also called the Final Examination, is scheduled when the Supervisory Committee agrees that the research is complete. The Reading Committee determines readiness of the dissertation.

- To establish a Reading Committee, the student sends the names, e-mail addresses, departments, and box numbers of at least 3 members of the Supervisory Committee (at least one of whom must be on the core faculty) to the Academic Counselor. It is expected that, by submitting these names, the faculty have agreed to be on the Reading Committee.
- The Reading Committee must be established at least **3 weeks prior** to the defense; however, Bioengineering faculty recommend six months lead time.
- It is never too early to start the process of scheduling an exam. The exam must be scheduled no later than the last day of the quarter. Exams scheduled after the last day of the quarter are not eligible to use the Degree Late Fee option (see note below). It is best to schedule the defense no later than 1 week before the last day of the quarter because the committee will likely recommend changes to the written document after observing the oral exam. Also, document production and signatures can take at least one day.
- Scheduling the Final Exam at a time when a quorum of Supervisory Committee members are available is the responsibility of the student. The quorum is Chair, GSR, and 2 additional committee members, at least one of whom has Graduate Faculty status. All exams must be held on the UW main campus to allow all departmental faculty, staff, and students the opportunity to attend. Exams should not be scheduled during the morning of the 2<sup>nd</sup> Tuesday of each month when faculty meetings are held.
- The student schedules an exam room on the main UW campus. Room scheduling details are available on the Administrative Homepage (<http://www.bioeng.washington.edu/home>). Schedule the room for a minimum of 2.5 hours to allow 15 minutes for set-up, 1 hour for defense and audience questions, 1 hour for closed committee questions, and 15 minutes for clean-up.

- The student must be registered in credits during the quarter the exam is held.
- **No later than** the last day of the month prior to the month of the exam, the student emails the Academic Counselor with the type of exam, title, date, time and location, advisor name, and names of all committee members, making sure to indicate the Chair. Exam information will be emailed to the BIOE community at the beginning of the month.
- Using the Final Exam request form (in the Handbook, see **Appendix L**), obtain exam request approval from ALL committee members. All members must approve of the request, including those who cannot attend. Email approval is sufficient but the email must be printed and attached to the request. The request must be received by the Academic Counselor no less than **3 weeks prior** to the exam date. An exam may not be held if the student has not submitted a signed Request for Final Exam form within the proper timeframe.
- Also at least **3 weeks prior** to the exam date, the student must submit the online exam request at <http://www.grad.washington.edu/mygrad/student.htm>
- A complete (or nearly complete) copy of the dissertation is sent to all committee members at least **3 weeks prior** to the Final Exam.
- Approval of the request for General Examination generates a warrant, which the Academic Counselor will give to the student about **3 days** before the exam. The student picks up the warrant and takes it to the oral portion of the exam.
- During the oral examination, the chairperson, the Graduate School Representative, and at least two additional examining committee members (one of whom must have Graduate Faculty status) must be present.
- If the Final Examination is satisfactory, the Supervisory Committee members sign the warrant and return it to the student. The student then gives the signed warrant to the Academic Counselor.

After completion of the Final Examination the student has 60 days to submit two signed copies of the dissertation to the Graduate School *but no later than the last day of the quarter*. If the dissertation meets the requirements of the Graduate School, the student can graduate. **Note:** to graduate the same quarter as the Final Exam, the student must submit the signed dissertation by the last day of finals week that quarter. If that deadline is not met, the Graduate School will allow a student to pay a \$250 late fee (in lieu of tuition) if the dissertation is submitted within 4 weeks of the following quarter (but no later than 60 days after the defense). Eligibility information and details are online at <http://www.grad.washington.edu/area/regwaiver.html>

## Dissertation Document Requirements

- Effective immediately, the Graduate School is no longer requiring students to deliver hard copy preliminary pages to the Graduate School for review following the Preliminary Review.

Since removing the stringent formatting requirements, once the Preliminary Review has been completed and students are ready to submit their entire document, students then need to have all un-numbered pages: Title page through the abstract. They also ask that you have the signature page reviewed prior to final submission. These pages should now be sent by email to Graduate Education Services at [gsstusrv@u.washington.edu](mailto:gsstusrv@u.washington.edu). The Graduate School will continue to review and reply to these requests within 5 business days.

- The Department recommends doing preliminary review and un-numbered/signature page check prior to the defense. Thus, correctly-formatted blank copies of the signature page can be brought to the defense in case members of the Reading Committee agree to sign at that time. Original signature pages are required for the 2 dissertation copies submitted to the Graduate School only.

- The preliminary review will be returned with instructions on fee payment, the publication agreement, and final submission. The student pays for the copying and binding of the required two dissertation copies submitted to the Graduate School. The student pays for the microfilm fee and requests reimbursement from the Department.
- Bioengineering will reimburse students for the microfilm charge and will pay for the binding of three additional hardbound copies of the dissertation; contact the Academic Counselor for the correct budget number. Students who want extra copies must pay for them. *The student is responsible for any printing costs.* The copies are made at the Communications Copy Center and can be bound in any color. One copy is for the student, one is for the research advisor, and one is for the department. If the student is leaving campus before the copies are ready, the copies should be sent to the academic counselor for distribution. The departmental copy is kept in Foege N240.

## Graduation

The student must be registered during the quarter that he or she graduates unless the Degree Late Fee option is used. All appropriate deadlines must be met or the degree will not be conferred. The degree will be posted to the UW transcript 3-4 weeks after the end of the quarter in which it is conferred. Diplomas are mailed out approximately 3 months later.

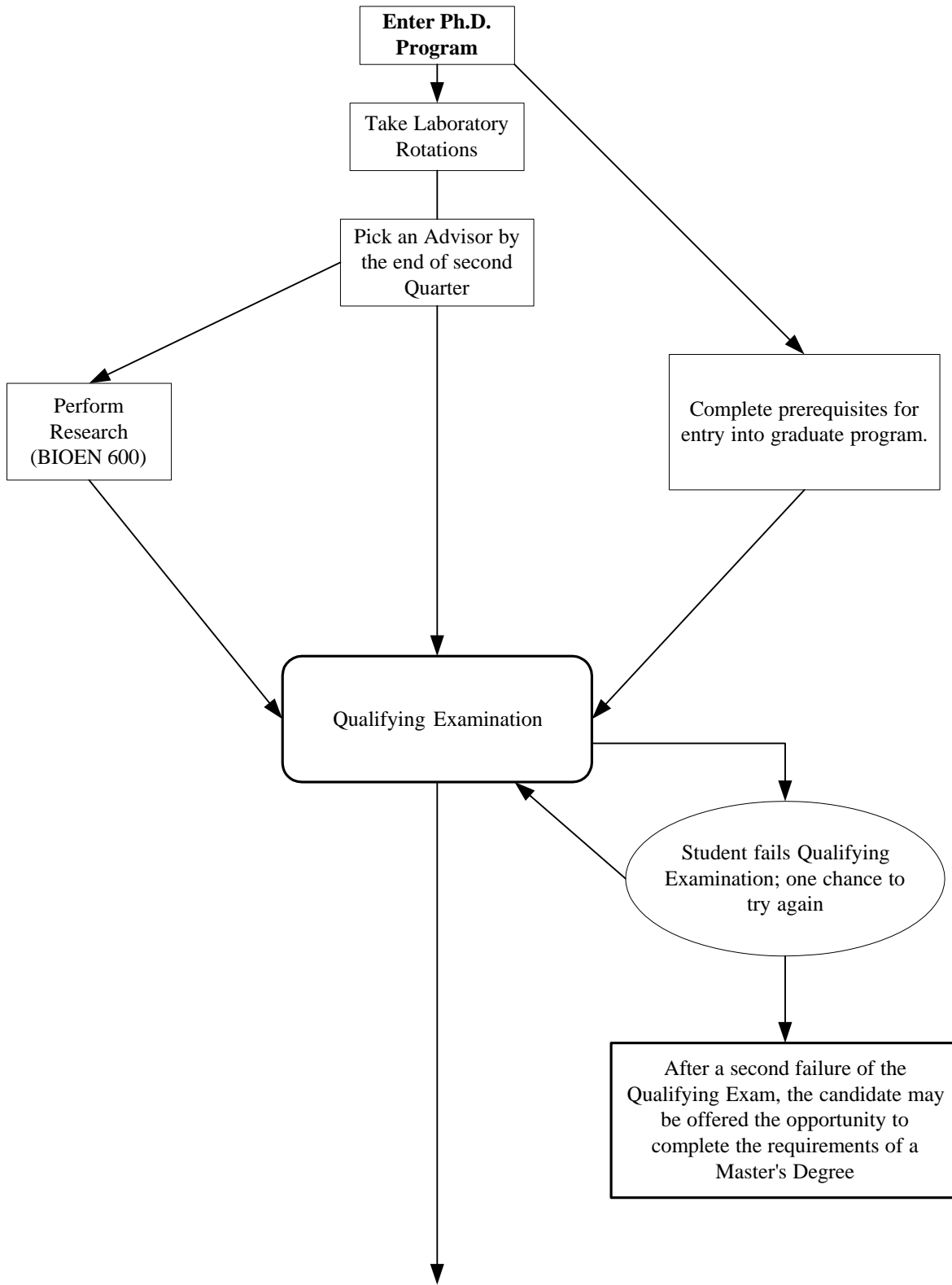
The University's main graduation ceremony is held immediately after the end of spring quarter. August graduates are allowed to walk in the June ceremony. The web site is at [www.uwgraduation.com](http://www.uwgraduation.com). The Department holds its own graduation celebration, during which our BS, MME, MS, and PhD graduates are recognized and honored. The Departmental ceremony is held the evening prior to the University ceremony.

Questions regarding Graduation can be directed to Graduate Student Services, G-1 Communications, 543-5900. The Office of Commencement Exercises is at 543-2592.

## Taking Leave of the Department

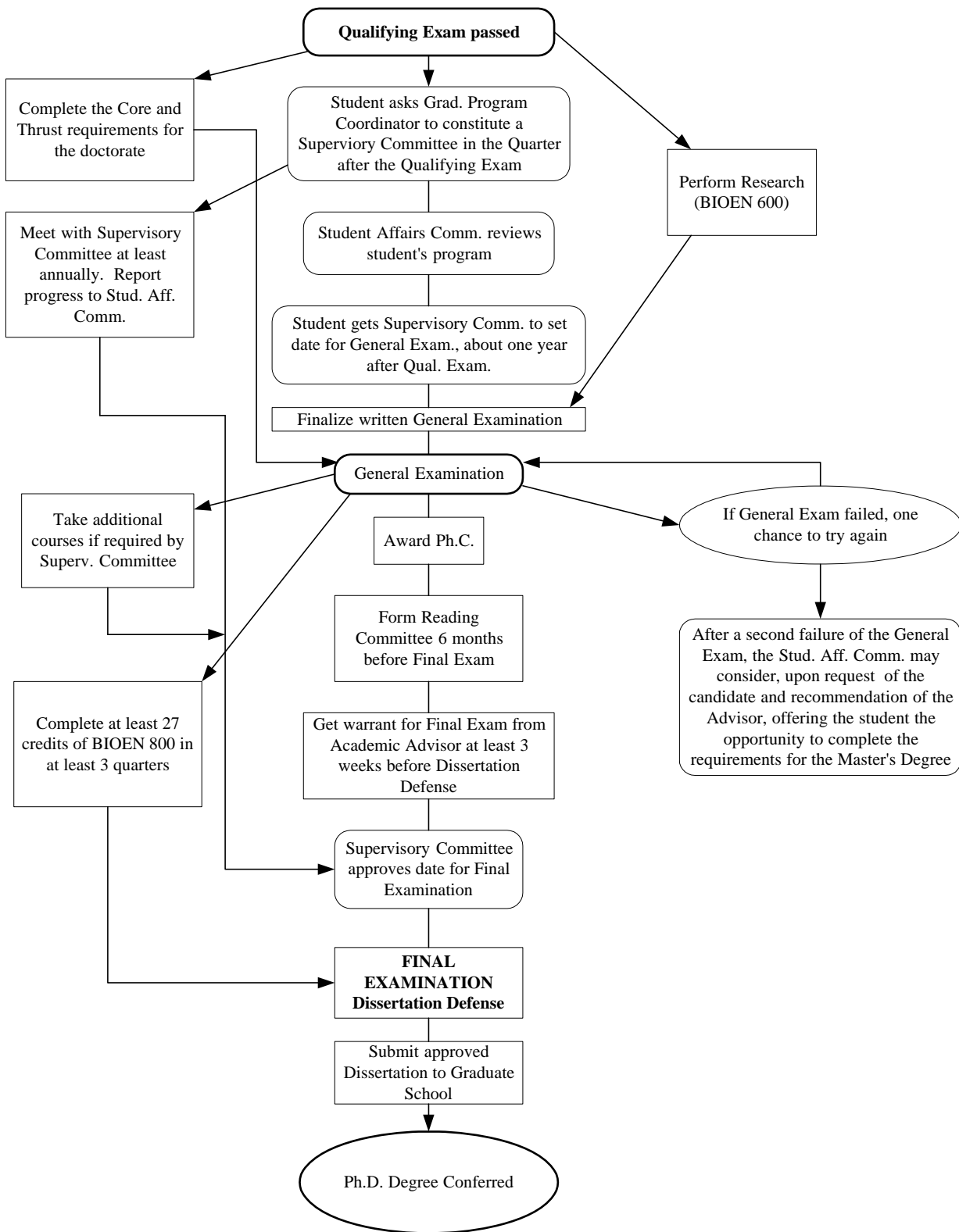
All graduating or otherwise exiting students must go through the official Departmental checkout process. The process involves lab checkout, returning of keys, payroll information, contact information and an exit interview with the Vice-Chair. The process **begins** by clicking on the exit form in the departmental section of the administrative website.

**Ph.D. Program: Pre-Qualifying Exam**



See next page: Ph.D. Program (Post Qual.)

**Ph.D. Program: Post-Qualifying Examination**



## Section 4: The MS Degree

### BS/MS

The department has a BS/MS option. Please refer to the Undergraduate Student Handbook and the departmental web site for information. A Teaching Assistantship is not required for BS/MS students.

Once admitted to the Master's track of the BS/MS program, it is possible to apply for admission to the PhD. The student must submit all required materials for the PhD application *except* for the Graduate School application. The student may or may not be admitted to the PhD with rotation (i.e. first-year) funding. Such a decision would be made by the Admissions Committee and be clearly stated in the offer of admission. The deadline to apply to switch to the PhD is March 15. The later deadline gives the applicant sufficient time to develop his or her research and gives the faculty advisor sufficient time to evaluate the research.

### MS BIOE

The MS BIOE is evidence of ability to work as an engineer and researcher who is capable of some independent investigation and who can present the results of that investigation cogently. The holder of the master's degree will have completed significant course work and a thesis that describes an independent investigation and will have passed a final examination of the research underlying the thesis.

The general goals and objectives for the master's degree program are the same as for the doctoral program. (See **Section 3**.)

The expected background knowledge for the Master's degree program is the same as for the doctoral program (see **Section 3**).

### General Requirements for the MS Degree

Please consult the Graduate School web site at <http://www.grad.washington.edu/students/masters/index.shtml>. Note that the Master's degree in Bioengineering requires a thesis.

### Specific Course Requirements for the MS Degree

*The following requirements apply to students who entered Autumn 2006 and later:*

To keep track of your coursework, please see the MS Planning Sheet, **Appendix D**. The degree requires 27 course credits. Petitions are not encouraged.

- BIOEN 501: Molecular Bioengineering (4 credits)
- BIOEN 502: Cellular Bioengineering (4 credits)
- BIOEN 503: Systems Bioengineering (4 credits)
- BIOEN 510: Introduction to Bioengineering (1 credit)
- 4 credits of Biostatistics: BIOST 511 or BIOEN 541
- 10 credits of research-related electives selected in consultation with faculty advisor. At least one course must be at the graduate level.

Additionally, students will complete 1-2 laboratory rotations and 1 Teaching Assistantship. The laboratory rotations occur during the first year of the MS degree. The Teaching Assistantship can be completed at any point during the MS degree but is encouraged to be undertaken at least two quarters prior to graduation.

**The following requirements apply to students who entered Autumn 2001- Summer 2006:**

To keep track of your coursework, please use the MS Planning Sheet, **Appendix D. Note**: A single course may not count for two separate requirements.

- 8 credits of Bioeng. Principles of Physiology: BIOEN 588, 589
- 4 credits of Advanced Instrumentation: BIOEN 436 or 581
- 3 credits of Biotransport: BIOEN 550
- 1 credit, Introduction to Bioengineering: BIOEN 510
- 4 credits of Biostatistics: BIOST 511
- 3-5 credits of Biochemistry or Cell Biology. Choose from:
  - BIOC 405, 406, 440, 441, 442, 530
  - BIOL 401, 402
  - CONJ 531, 532, 533 (1.5 credits each; offered sequentially during Autumn quarter; must take at least two to earn enough credit)
  - MCB 511
  - MICROM 410, 431
- 4 credits of Engineering Breadth. Choose from:
  - BIOEN 540, 568, 599 (Microfabrication and Microfluidics) **or** Graduate engineering courses from other engineering departments (this excludes Technical Communication courses and courses cross-listed with Bioengineering)
- 6 credits within a single thrust area

## Switching from MS to PhD

Once admitted to the Master's track, it is possible to switch to the Doctoral program. In order to initiate the switch, a student must apply to switch to the PhD program prior to completing the Master's program. To apply, the student must complete all required materials for the PhD application, including the online application: <https://www.grad.washington.edu/applForAdmiss/>. However, instead of submitting the application to the Graduate School with the fee, the student will print the application and supplemental materials (personal statement, CV/Resume, test scores and 3 letters of Recommendation), upon completion, and submit them to the Graduate Academic Advisor. After submitting your materials to the Academic Advisor, all materials will then need to be approved by the Graduate Admissions Committee. As the application must be received/reviewed within the regular Admissions Cycle (December –March), **the deadline to apply to switch to the PhD is March 15.**

If a student plans to graduate with a Master's degree but would like to return to the Department for a PhD within a year, to avoid reapplication, the student must follow the same process as above (complete, print, and submit to the Academic Advisor: the graduate application: <https://www.grad.washington.edu/applForAdmiss/>, CV/Resume, Personal Statement, 3 letters of Recommendation, and test scores), as well as a petition to the Student Affairs Committee for up to a 1-year leave of absence. **The petition for a leave of absence and relevant application materials must be completed and submitted prior to MS graduation in order to be reviewed by both the Student Affairs and Graduate Admissions Committees (no later than March 15<sup>th</sup>).** Extensions to the leave of absence will not be granted.

If there has been a break in enrollment after MS graduation and the student had not previously submitted a petition and all relevant application materials prior to March 15<sup>th</sup> and MS graduation, the student must reapply to the Graduate School and submit the application fee by the International/Domestic Application deadlines. The student may or may not be admitted to the PhD with rotation (i.e. first-year) funding. Such a decision would be made by the Admissions Committee and be clearly stated in the offer of admission. All students admitted to the PhD program must take the Qualifying Exam.

BS/MS students must reapply to the PhD program with all application materials, including the Graduate School Application within the timeframe of the regular admissions cycle.

## Timeline and Progression through the MS Degree

Please review the "First Year Advising and Satisfactory Progress" information in **Section 3**. Satisfactory progress in the first-year is the same for MS and PhD students though Master's students are not looking ahead to a Qualifying Exam.

The master's thesis is a document that demonstrates the author's ability to solve a problem independently and to describe the solution clearly and succinctly. The document must show the way that the problem was posed, the methods used for its solution, and the successful solution of the problem. The thesis should suggest the importance of the results and their application to other problems of the same kind. The thesis is based on work performed while taking at least 9 credits of BIOEN 700. The Graduate School's Style and Policy Manual for Theses and Dissertations can be printed from the web site at <http://www.grad.washington.edu/stsv/stylman/00stylman.htm>.

- Total time to completion of the Master's degree is expected to take from six to eight quarters. It is a Graduate School requirement that all work for the Master's Degree must be completed within 6 years.
- By the end of their **second quarter** of enrollment, master's students must find a research advisor with whom to prepare a plan of studies and research. The research advisor will ultimately supervise the thesis.
- We expect a master's student to have a **Supervisory Committee appointed by the fourth quarter**. The Supervisory Committee consists of a minimum of two and no more than four members. The majority of the Committee, including the chairperson, must be members of the Graduate Faculty (see <http://www.grad.washington.edu/gradfac>). At least one member of the Supervisory Committee must be a member of the Core Faculty in Bioengineering. Master's Supervisory Committees do not require the Dean's approval nor do they require a Graduate School Representative.
- The Graduate Student Plan (see **Appendix J**) is drawn up by the student in consultation with the research advisor. The student gives the plan to the Academic Counselor to submit to the Student Affairs Committee for approval; this also notifies the Committee of the Supervisory Committee's membership.
- Master's students may begin taking BIOEN 700 after their student plan is approved. The student must complete at least 9 credits of BIOEN 700.
- When the Supervisory Committee and the student agree that the thesis is ready to defend, the student applies to the Graduate School for the Master's Degree. The application is online at <https://www.grad.washington.edu/student/mastapp.aspx>. A student may apply up to the 7<sup>th</sup> week of the graduation quarter. Please note that the web application will ask whether this is a thesis or non-thesis option. We have only a thesis option for our master's degree, so this option must be selected. The web application will include a diploma request and an exit questionnaire. The Graduate School will confirm receipt of the request by email.
- After the faculty advisor has reviewed and approved of the thesis, a complete or nearly complete copy must be submitted to committee members at least **2 weeks** before the exam date.
- The student arranges the time and place of the final exam. All exams must be held on the UW main campus to allow all departmental faculty, staff, and students the opportunity to attend. Exams should not be scheduled during the morning of the 2<sup>nd</sup> Tuesday of each month when faculty meetings are held. Room scheduling details are available on the Administrative Homepage (<http://www.bioeng.washington.edu/home>).
- **No later than** the last day of the month prior to the month of the exam, the student emails the Academic Counselor with the type of exam, title, date, time and location, advisor name, and names of all committee members, making sure to indicate the Chair. Exam information will be emailed to the BIOE community at the beginning of the month.

- The online graduation application will generate a warrant which can be picked up from the Academic Counselor about **three days prior** to the exam. The student must bring the warrant to the exam.
- The thesis is defended orally and, if the student passes the defense, the members of the Supervisory Committee will sign both the warrant and the thesis itself. Two copies of the signed thesis are submitted to the Graduate School for final approval no later than the last day of the quarter in which the student expects to receive the degree.
- The Graduate School is particular about format and requires a thesis Preliminary Review prior to thesis submission. See <http://www.grad.washington.edu/students/thesis-dissertation/preliminary-review.shtml>
- By signing the warrant, the committee certifies that the student has met *all* departmental requirements. The signed warrant must be returned to the Senior Academic Counselor no later than the last day of the quarter (last day of exams) in which the student expects to graduate. If this deadline is not met, the Graduate School will allow a student to pay a \$250 late fee (in lieu of tuition) if the thesis is submitted within 4 weeks of the following quarter. Eligibility information and details are online at <http://www.grad.washington.edu/degreetatefee.html>
- If the examination is not satisfactory, the committee may recommend to the Dean of the Graduate School that the student be allowed to take another examination after a period of further study.

## Graduation

The student must be registered during the quarter that he or she graduates. An application for graduation must be submitted online according to the Graduate School's deadline. See <http://www.grad.washington.edu/stsv/mastapp.aspx>

All appropriate deadlines must be met or the degree will not be conferred. The degree will be posted to the UW transcript 3-4 weeks after the end of the quarter in which it is conferred. Diplomas are mailed out approximately 3 months later.

The University's main graduation ceremony is held immediately after the end of spring quarter. August graduates are allowed to walk in the June ceremony. The web site is at [www.uwgraduation.com](http://www.uwgraduation.com). The Department holds its own graduation celebration, during which our BS, MME, MS, and PhD graduates are recognized and honored. The Departmental ceremony is held the evening prior to the University ceremony.

Questions regarding Graduation can be directed to Graduate Student Services, G-1 Communications, 543-5900. The Office of Commencement Exercises is at 543-2592.

## Taking Leave of the Department

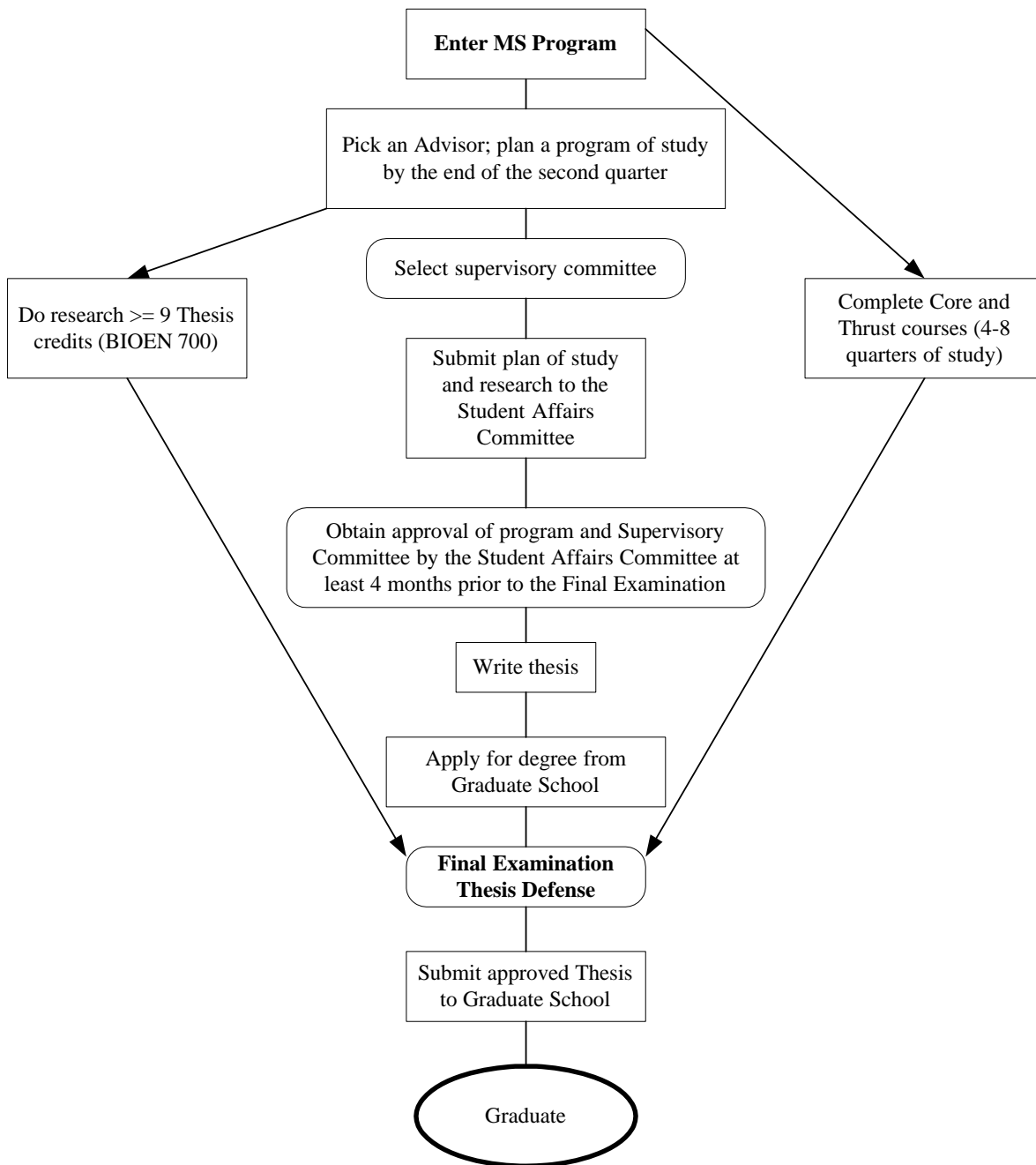
All graduating or otherwise exiting students must go through the official Departmental checkout process. The process involves lab checkout, returning of keys, payroll information, contact information and an exit interview with the Vice-Chair. The process **begins** by clicking on the exit form in the departmental section of the administrative website.

The degree will be posted to the UW transcript 3-4 weeks after the end of the quarter in which it is conferred. Diplomas are mailed out approximately 3 months later.

The University's main graduation ceremony is held immediately after the end of spring quarter. August graduates are allowed to walk in the June ceremony. The web site is at [www.uwgraduation.com](http://www.uwgraduation.com). The Department holds its own graduation celebration, during which our BS, MME, MS, and PhD graduates are recognized and honored. The Departmental ceremony is held the evening prior to the University ceremony.

Questions regarding Graduation can be directed to Graduate Student Services, G-1 Communications, 543-5900. The Office of Commencement Exercises is at 543-2592.

## MS Degree Program in Bioengineering



## Section 5: The MME Degree

### Master of Medical Engineering Degree

The Master of Medical Engineering Degree (MME) is a professional degree program administered jointly by UW Extension and the Department of Bioengineering. MME students are working professionals who hold undergraduate degrees in traditional engineering disciplines. MME students complete evening coursework in Basic Medical Sciences, Medical Diagnostics, Medical Devices and Commercialization, and Biosensors and Biomaterials, attend the Bioengineering Departmental seminar, and have the option of completing and defending an MME thesis under the supervision of Bioengineering faculty.

### Admission

Medical Engineering certificate students can apply for degree status at any of these checkpoints:

- Before the first certificate
- Before the second certificate
- At the end of the second certificate\*

To ensure that students have met the Graduate School's requirements for matriculated credits, degree applications are not accepted after the third certificate. Applications are accepted for Fall Quarter only.

\*If applying for degree status at this point, a student must have Graduate Non-Matriculated (GNM) status during the second certificate.

If the applicant wishes to join the **thesis track**, he or she must secure a faculty advisor (with Graduate Faculty status) prior to application, submit a research statement, provide a faculty advisor's letter of support, and provide a document from the student's place of employment stating that the thesis does not present of conflict of interest of intellectual property.

A complete application will consist of:

- Graduate School application and fee <https://www.grad.washington.edu/applForAdmiss>
- Two letters of recommendation describing applicant's engineering skills and ability to complete an advanced degree
- Personal statement describing reasons for applying to the degree
- Resume`
- Official scores from the general test of the Graduate Record Exam <http://www.gre.org>
- Official transcripts from all post-secondary institutions attended
- If applying for the thesis, a brief research statement and a letter of support from faculty advisor

All materials must be received by the posted deadline. See [http://depts.washington.edu/bioe/education/prospective/educ\\_master\\_mede.html](http://depts.washington.edu/bioe/education/prospective/educ_master_mede.html)

### Graduate School Requirements

Once accepted to the degree program, a student is subject to the rules and procedures of the UW Graduate School. Please consult the Graduate School web site at <http://www.grad.washington.edu/students/masters/index.shtml>

### Continuous Registration

If accepted to the degree, MME students hold graduate student status. As a graduate student, you are required to register for and complete credits every quarter until you graduate, with the exception of summer quarters. Students must be registered for at least 1 credit per quarter. Failure to maintain continuous enrollment results in being dropped from the degree program and the Graduate School. Students who wish to reenter the degree program will need to reapply to the Graduate School and the Department; readmission will not be

automatic but decided by the Department's Student Affairs Committee. ALL registration is handled through the UW Extension office.

Students who need to arrange a leave of absence can access the Petition from online. The form can be found at <http://www.grad.washington.edu/forms/on-leave-request.pdf> as well as at <http://www.grad.washington.edu/stsv/leave.htm> which provides details about the On-Leave policy.

Please note that On-Leave Status is reserved for exceptional circumstances. Petitions must be **signed by the Department's GPC at least 1 week before the quarter begins and submitted to the Registration office before the 5th day of class.**

## Grades

Students must maintain a 3.0 cumulative grade point average to maintain good standing with the Graduate School and the department. Students must earn a 2.7 or better in every course.

## GNM Credit Limitation

A limit of 12 credits earned while on GNM (Graduate Non-Matriculated) status can be counted toward the credit requirement for the degree. Please direct any questions about GNM status to the Academic Counselor.

## Registration

All registration is administered by UW Extension, including registration for the Bioengineering seminar and BIOEN 700 thesis credits. In late Autumn Quarter, contact the Academic Counselor for information on Winter Bioengineering Seminar registration. Do the same in late Winter Quarter for Spring. All fees will continue to be paid to UW Extension.

## Departmental Requirements

### Coursework

All MME students complete 4 certificates and the Departmental Seminar. Thesis track students complete 2 credits of the Departmental Seminar; non-thesis track students complete 4 credits of the Departmental Seminar.

The certificates are as follows:

### **Basic Medical Sciences (should be completed first; also is a prerequisite to Biosensors and Biomaterials)**

Courses: Cell Biology lecture + lab; Anatomy lecture + lab; Physiology lecture + lab.

### **Medical Diagnostics**

Courses: Medical Imaging Diagnostics; Clinical Diagnostics; Intro to Epidemiology.

### **Medical Devices and Commercialization**

Courses: Medical Device Design; Regulatory Affairs for the Medical Device Industry; Medical Device Commercialization.

### **Biosensors and Biomaterials**

Courses: Medical Chemistry; Biosensors; Biomaterials & Biocompatibility.

The **Bioengineering Departmental Seminar** (1 credit, cr/nc grade) is offered Winter and Spring quarters only, Thursdays from 12:30 – 1:20 p.m. The seminar highlights current research in Bioengineering through a series of lectures by Bioengineering faculty and students. MME students can choose to attend the lectures in person or view the lectures by video on demand or by broadcast (live or delayed) on UW TV Channel 27. Lectures from past quarters are available at <http://depts.washington.edu/bioe/about/news/seminars/599J/index.html>. Thesis track students complete 2 credits of Bioengineering seminar; non-thesis track students complete 4 credits of Bioengineering seminar.

In addition to the 4 certificates and 2 credits of Bioengineering seminar, thesis-track students complete a minimum of 9 credits of BIOEN 700 (Thesis Research). BIOEN 700 can be taken after thesis students have found a Faculty Advisor and agreed upon a research project (see section below on progression through the degree).

## Petitions

Students are *not* encouraged to petition to waive required courses or make substitutions for them. In rare cases, a student may have a compelling argument that a course should be waived or a substitution allowed. In that case, the student fills out the Petition/Waiver/Substitution form (**Appendix G**), gets the research supervisor's signature (when appropriate), and submits it to the Academic Counselor, who will take it to the Student Affairs Committee for review.

## Grievances

Students are encouraged to speak first with the Academic Counselor. Together the student and Counselor will work to find a positive solution. If the student feels a suitable solution has not been found, the student may submit a petition to the Department Chair. In all cases the student has the option of following the Graduate School's grievance guidelines: <http://www.grad.washington.edu/area/grievances.htm>.

## UW Services

See the list of services available to MME students at <http://www.edoutreach.washington.edu/ext/studentinfo/default.asp>

## Time to Graduation

Non-thesis track MME students should graduate upon completion of their fourth certificate.

Thesis-track MME students should graduate within 15 months of completing their fourth certificate. Extensions would need to be requested by letter of petition, along with a letter of concurrence from the research supervisor, to the Student Affairs Committee and should be justified by the nature of the thesis project.

All MME students must apply for graduation no later than the second week of the last quarter of registration. For example, if you will complete your last class in spring, apply for graduation by the second week of Spring Quarter. Applications are made online at <http://www.grad.washington.edu/student/mastapp.aspx>. See the graduation section below.

## Timeline and Progression through the Degree Program

An expected timeline for NON-THESIS TRACK students is as follows:

**Year 1:** Basic Medical Sciences  
18 credits

*Summer between years 1 and 2:* Apply for Graduate Non-Matriculated (GNM) status

**Year 2:** Second certificate  
12 credits

**Year 3:** Third certificate  
12 credits + 2 credits Bioengineering seminar

**Year 4:** Fourth certificate  
12 credits + 2 credits Bioengineering seminar

TOTAL PROGRAM CREDITS: 58

An expected timeline for THESIS-TRACK students is as follows:

**Year 1:** Basic Medical Sciences

18 credits

*Summer between years 1 and 2: Apply for Graduate Non-Matriculated (GNM) status*

**Year 2:** Second certificate

12 credits

**Year 3:** Third certificate

12 credits + 2 credits Bioengineering seminar + research

**Year 4:** Fourth certificate

12 credits + research

**Year 5:** MME Thesis

9 credits BioEn 700 + oral defense + written thesis

**Final 3 months:**

Schedule final examination; finish thesis; pass final exam; submit two copies of corrected, signed thesis to the Graduate School.

TOTAL PROGRAM CREDITS: 65

### **Satisfactory Progress**

To make satisfactory progress in the program, MME students should adhere to the suggested timeline for their degree track, meet minimum GPA standards, maintain continuous enrollment, register and pay fees through UW Extension and consult regularly with the Faculty Advisor and/or Academic Counselor.

### **Selection of Faculty Advisor (Thesis students)**

Selection of the Faculty Advisor is a crucial choice, as this person guides your thesis research, judges the quality and significance of your results, determines readiness for the final exam, administers the exam as Chair of the Supervisory Committee, and judges the quality of your thesis. Selecting your advisor is the first significant step towards your master's thesis.

### **Thesis**

The master's thesis is a document that demonstrates the author's ability to solve a problem independently and to describe the solution clearly and succinctly. The document must show the way that the problem was posed, the methods used for its solution, and the successful solution of the problem. The thesis should suggest the importance of the results and their application to other problems of the same kind. The thesis is based on work performed while taking at least 9 credits of BIOEN 700.

The Graduate School's Style and Policy Manual for Theses and Dissertations can be printed from the web site at <http://www.grad.washington.edu/students/thesis-dissertation/index.shtml>. (Note: The Graduate School is very particular about format and requires a preliminary and final review of thesis formatting. See <http://www.grad.washington.edu/area/thesisubmittips.html>)

### **Thesis Topic and Content**

Your thesis topic may be conceived by you or suggested by your thesis advisor or other faculty member. It may concern applied or basic research or involve the development of a device, method, algorithm, or material. Approval of the thesis topic is negotiated between the student and the advisor. **NOTE: To avoid problems of intellectual property, thesis topics and content CANNOT overlap with any work done at the student's place of employment.**

Thesis content is also negotiated between student and advisor, but some ideas follow. Your introduction might discuss the importance of your topic in terms of potential benefit to people and potential economic impact should a company or medical product result from your research. You are likely to conduct an extensive

literature review on your topic and include a critical review of the literature in your thesis. Depending on the topic, the thesis may include theoretical, laboratory and/or clinical work, or simulations, and will present objective goals and hypotheses and supporting data in appropriate form (calculations, measures, tabular and graphical displays, statistical analysis, etc.). The thesis content should be of the quality that it could be submitted for possible publication to a respected journal suggested by your thesis advisor.

## Supervisory Committee

The Supervisory Committee offers breadth of expertise to the student in conducting research and quality control to the thesis and final exam. The Supervisory Committee consists of at least two and no more than four members. The student's Research Supervisor chairs the Supervisory Committee. The majority of the Committee, including the chairperson, must be members of the Graduate Faculty. (If there are only two members, both must be Graduate Faculty). At least one member of the Supervisory Committee must be a member of the Core Faculty in Bioengineering. MME students are strongly recommended to have three committee members.

You may need approval for human, animal, radiation or biohazard research through the appropriate UW committees. It is your responsibility to file those applications with the guidance of your thesis advisor. It is also your responsibility to assure that intellectual property procedures are followed.

You may do the research work for your thesis on the UW campus using teaching facilities or research laboratory facilities with the approval of your thesis advisor and the university staff responsible for the facilities. You may do the research off campus at institutions and/or facilities that you arrange with the approval of your thesis advisor and the supervisors of those facilities. **NOTE: To avoid problems of intellectual property, thesis topics and content CANNOT overlap with any work done at the student's place of employment.**

## Final Exam

- When the Supervisory Committee and the student agree that the thesis is ready to defend, the student applies to the Graduate School for the Master's Degree. The application is online at <http://www.grad.washington.edu/stsv/mastapp.htm>. A student may apply up to the 7<sup>th</sup> week of the graduation quarter. Please note that the web application will ask whether this is a thesis or non-thesis option. We have only a thesis option for our master's degree, so this option must be selected. The web application will include a diploma request and an exit questionnaire. The Graduate School will confirm receipt of the request by email.
- After the faculty advisor has reviewed and approved of the thesis, a complete or nearly complete copy must be submitted to committee members at least **2 weeks** before the exam date.
- The student arranges the time and place of the final exam. All exams must be held on the UW main campus to allow all departmental faculty, staff, and students the opportunity to attend. Exams should not be scheduled during the morning of the 2<sup>nd</sup> Tuesday of each month when faculty meetings are held. Room scheduling details are available on the Administrative Homepage (<http://www.bioeng.washington.edu/home>).
- **No later than** the last day of the month prior to the month of the exam, the student emails the Academic Counselor with the type of exam, title, date, time and location, advisor name, and names of all committee members, making sure to indicate the Chair. Exam information will be emailed to the BIOE community at the beginning of the month.
- The online graduation application will generate a warrant which can be picked up from the Academic Counselor about **three days prior** to the exam. The student must bring the warrant to the exam.
- The thesis is defended orally and, if the student passes the defense, the members of the Supervisory Committee will sign both the warrant and the thesis itself. Two copies of the signed thesis are submitted to the Graduate School for final approval no later than the last day of the quarter in which the student expects to receive the degree.

- The Graduate School is particular about format and requires a thesis Preliminary Review prior to thesis submission. See <http://www.grad.washington.edu/students/thesis-dissertation/preliminary-review.shtml>
- By signing the warrant, the committee certifies that the student has met *all* departmental requirements. The signed warrant must be returned to the Senior Academic Counselor no later than the last day of the quarter (last day of exams) in which the student expects to graduate. If this deadline is not met, the Graduate School will allow a student to pay a \$250 waiver fee (in lieu of tuition) if the thesis is submitted within 4 weeks of the following quarter. Eligibility information and details are online at <http://www.grad.washington.edu/area/regwaiver.html>
- If the examination is not satisfactory, the committee may recommend to the Dean of the Graduate School that the student be allowed to take another examination after a period of further study.

## Graduation

All MME students (thesis and non-thesis tracks) must be registered during the quarter of graduation and apply for graduation at <https://www.grad.washington.edu/stsv/mastapp.aspx>. The degree will be posted to the UW transcript 3-4 weeks after the end of the quarter in which it is conferred. The Registrar's Office mails diplomas approximately 3 months later.

The University's main graduation ceremony is held immediately after the end of spring quarter. August graduates are allowed to walk in the June ceremony. The web site is at [www.uwgraduation.com](http://www.uwgraduation.com). The Department holds its own graduation celebration, during which our BS, MME, MS, and PhD graduates are recognized and honored. The Departmental ceremony is held the evening prior to the University ceremony.

Questions regarding Graduation can be directed to Graduate Student Services, G-1 Communications, 543-5900. The Office of Commencement Exercises is at 543-2592.

## Taking Leave of the Department

We ask that you leave a forwarding address, position title, and other contact information with the Academic Counselor when you graduate.

## Section 6: Graduate Student Resources

Below is an incomplete list of resources and information that may be useful to you during your graduate student career. Questions about any of these topics should be addressed to the Academic Counselor.

The **Graduate School** has compiled an excellent set of **guidelines** to describe what the graduate student and advisor can expect of one another and general 'guidelines for good practice' in graduate education. The sections are divided by Professionalism and Ethics, Teaching, and Mentoring. See [http://www.grad.washington.edu/area/goodpract/m\\_good\\_pract.htm](http://www.grad.washington.edu/area/goodpract/m_good_pract.htm)

The **Department** has several committees with seats reserved for graduate students. We encourage interested students to **get involved** with one of the following committees: Student Affairs, Curriculum, and the Student Advisory Board. See the Academic Counselor for details or to express interest in serving on a committee.

Bioengineering students have access to two Departmental **computer labs** in addition to all UW computer labs. See [http://depts.washington.edu/bioe/about/about\\_facilities.html](http://depts.washington.edu/bioe/about/about_facilities.html)

Get **connected** with your peers outside the Department through the **GO-MAP** office <http://www.grad.washington.edu/gomap/default.htm> and the Center for Workforce Development's mentoring program for women <http://www.engr.washington.edu/advance/mentoring/index.html> You are also encouraged to join the UW student chapters of **BMES** <http://www.students.washington.edu/bmesuw> and **IEEE/EMBS** <http://students.washington.edu/embs>

To assist you in your preparation for **post-graduate** life, we encourage you to join the UW Alumni Association <http://www.washington.edu/alumni/> and review the industry information posted in the student section of the administrative website: <http://www.bioeng.washington.edu/home/>.

**Funding** is a necessary component of life as a graduate Research Assistant. Early-stage students are encouraged to apply for the NSF and/or NDSEG fellowships. Post-Qualifying Exam students are encouraged to apply for traineeships when slots are available (look for emails from the Academic Counselor). Post-General students are encouraged to apply for the NIH Kirschstein F31 predoctoral fellowship. Other funding opportunities are posted on the administrative website at <http://www.bioeng.washington.edu/home/Students/Scholarships/grants.htm>. If a faculty advisor informs the student that funding is no longer available, the student should contact the Academic Counselor immediately. The Department does not have **travel funds** but students may apply to the Graduate and Professional Student Senate (GPSS), see <http://www.gpss.washington.edu/>. Very limited travel funds are sometimes available from the Graduate School; contact the Academic Counselor for an update.

Special note about **fellowships**: MS or PhD students who receive an NSF, NDSEG or other full fellowship will receive a 10% stipend supplement for the duration of the award. 'Full fellowship' is defined as a non-UW financial award that provides at least 75% of the tuition costs, at least 75% of the health insurance costs, and at least 75% of the BIOE monthly stipend. The faculty advisor will provide (from a non-federal source) funding to ensure that the student's tuition, benefits, and stipend meet the BIOE rates in addition to providing a 10% supplement to the stipend. The 10% supplement is calculated based on the current BIOE stipend rate. When the award ends, the student returns to the BIOE stipend rate.

Students funded as Research Assistants, Teaching Assistants, or Trainees are covered by the UW/UAW Academic Student Employee **union contract**: <http://www.washington.edu/admin/hr/laborrel/contracts/uaw/addons/index.html> and have access to the Graduate Appointee **Insurance** Program:

<http://www.washington.edu/admin/hr/benefits/insure/gaip/index.html> Review these websites then contact the Academic Counselor if there are any questions.

## Appendix A: Expected Background for the Graduate Program

(For students admitted Autumn 2006 or later)

Starting in Autumn 2006, students admitted to the Bioengineering graduate program are expected to be knowledgeable of the topics listed below **PRIOR** to entering the graduate program. These requirements also apply to students admitted Autumn 2005 who choose to follow the new curriculum. Students are responsible for ensuring they have adequately learned the concepts listed for each prerequisite.

Well-qualified students may be admitted to the graduate program missing some background; however, they will be expected to be knowledgeable of these topics prior to entering the graduate program.

Applicants can complete missing background topics in classroom and/or self-study format.

- Algebra, linear algebra, trigonometry
- Ordinary differential equations
- Signal analysis
- Probability theory and statistics
- Programming
- Electrical engineering and physics
- Chemistry (inorganic, organic, biochemistry)
- Material science
- Rate processes and mathematics
- Cellular biology

## Appendix A: Prerequisites for the Graduate Program

(For students admitted Autumn 2001 – Autumn 2005)

Students admitted to the Bioengineering graduate program between Autumn 2001 and Autumn 2005 are expected to have the prerequisite courses (or equivalents) listed below with a minimum grade of 2.7. These requirements will also apply to students admitted Autumn 2000 who choose to follow the new curriculum.

Well-qualified students may be admitted to the graduate program missing some prerequisites; however, they will be expected to complete these courses prior to taking their PhD qualifying exams or MS thesis defense.

Requirement	UW undergraduate courses satisfying this requirement	Comments
Ordinary differential equations	<b>Math 307</b>	Prereq: 2.0 in one of <b>Math 125, 128, 145</b>
Linear algebra	<b>Math 308</b>	Prereq: 2.0 in one of <b>Math 126, 146</b>
Instrumentation	One of these options: <b>BIOEN 302</b> Both <b>PHYS 334/335</b> <b>ME 473</b> <b>EE 436</b>	
Signal processing	One of these options: <b>BIOEN 303</b> <b>EE 235</b>	
Engineering systems analysis	One of these options: <b>BIOEN 301</b> <b>AA 448/EE 448</b> Any one of <b>EE 341, 442, 446</b> <b>ME 471</b>	
Thermodynamics (or a Physical Chemistry course that covers thermodynamics)	One of these options: One of <b>CHEM 452, 456</b> <b>CHEME 260</b>	
Cell Biology	<b>BIOL 201 and 202 (old #'s)</b> OR <b>BIOL 180 and 200 (new #'s)</b>	Prereq: <b>CHEM 152</b> for <b>BIOL 180</b>

## APPENDIX B:

### Expected Background Approval Checklist

(for students admitted Autumn 2001 – Autumn 2005)

Student Name: \_\_\_\_\_

Date Requested: \_\_\_\_\_

Expected background courses should be assessed upon entry to our program. The student should have had courses comparable to the UW courses listed below, **or** had a combination of courses which, taken together, cover the equivalent material. The academic counselors, first-year advisor, research supervisor, department Chair, or department Vice Chair can initial "BIOE approval". The GPC (Vice Chair) will give a final review. **Note:** each course must be completed with a minimum grade of 2.7 and all courses must be completed prior to the Qualifying Exam.

Expected Background Courses	Course(s) Satisfying Expected Background Requirement	At which school was the requirement satisfied?	Date Satisfied	BIOE Approval <i>(initial)</i>
Ordinary Differential Equations (UW MATH 307)				
Linear Algebra (UW MATH 308)				
Instrumentation (UW BIOEN 302)				
Signal Processing (UW BIOEN 303)				
Engineering Systems Analysis (UW BIOEN 301)				
Thermodynamics (or a Physical Chemistry course that covers thermodynamics) (UW CHEME 260, CHEM 452, 456)				
Cell Biology (UW BIOL 180 & 200)				

GPC Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix C: PhD Planning Sheet

(For students admitted Autumn 2006 or later)

**CORE REQUIREMENTS:**

Requirement	Course	Quarter	Credits	Grade
BIOEN 510			1	
BIOEN 501			4	
BIOEN 502			4	
BIOEN 503			4	

**ADDITIONAL REQUIREMENTS:**

Biostatistics (BIOST 511 or BIOEN 599: Bioengineering Statistics)			4	
16 Bioengineering elective credits (must be 400- or 500-level; must be chosen in consultation with advisor)			16	

**APPROVED COURSE SUBSTITUTIONS (none allowed for core requirements):**

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# Appendix C: PhD Planning Sheet

(For students admitted Autumn 2001-Autumn 2005)

**CORE REQUIREMENTS:**

Requirement	Course	Quarter	Credits	Grade
BIOEN 581				
BIOEN 510				
BIOEN 550				
BIOEN 588				
BIOEN 589				
BIOST 511				
3-5 Biochemistry or Cellular Biology credits				
8 Engineering Breadth credits				
12 Thrust Sequence Credits				

**APPROVED COURSE SUBSTITUTIONS:**

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## Appendix D: MS Planning Sheet

(For students admitted Autumn 2006 or later)

**CORE REQUIREMENTS:**

Requirement	Course	Quarter	Credits	Grade
BIOEN 510			1	
BIOEN 501			4	
BIOEN 502			4	
BIOEN 503			4	

**ADDITIONAL REQUIREMENTS:**

Biostatistics (BIOST 511 or BIOEN 599: Bioengineering Statistics)			4	
10 Bioengineering elective credits (must be 400- or 500-level; must be chosen in consultation with advisor)			10	

**APPROVED COURSE SUBSTITUTIONS (none allowed for core requirements):**

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## Appendix D: MS Planning Sheet

(For students admitted Autumn 2001 – Autumn 2005)

**CORE REQUIREMENTS:**

Requirement	Course	Quarter	Credits	Grade
BIOEN 581			4	
BIOEN 510			3	
BIOEN 550			4	
BIOEN 588			3	
BIOEN 589			4	
BIOST 511			4	
3-5 Biochemistry or Cellular Biology credits			3-5	
4 Engineering Breadth credits			4	
6 Thrust Sequence Credits			6	

**APPROVED COURSE SUBSTITUTIONS:**

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## Appendix E: Master's of Medical Engineering (MME) Planning Sheet Non-Thesis Option

Name: \_\_\_\_\_

Quarter/Year Admitted to Degree Program: \_\_\_\_\_

Outreach ID: \_\_\_\_\_

Quarter/Year Admitted to GNM Status: \_\_\_\_\_

UW ID: \_\_\_\_\_

Year 1		
Basic Medical Sciences (18 credits)		
Requirement	Enter Year Taken	Grade (Credits)
Anatomy Seminar	BSTR 540 (Thursday) Fall Quarter	(4)
Anatomy Lab	CONJ 585 (Saturday) Fall Quarter	(2)
Physiology Lecture	PBIO 520 (Thursday) Winter Quarter	(4)
Physiology Lab	PBIO 508 (Saturday) Winter Quarter	(2)
Cell Biology Lecture	BIOEN 530 (Thursday) Spring Quarter	(4)
Cell Biology Lab	BIOEN 531 (Saturday) Spring Quarter	(2)

Year 2		
Medical Diagnostics (12 credits)		
Requirement	Enter Year Taken	Grade (Credits)
Medical Imaging Diagnostics	BIOEN 538 (Tuesday) Fall Quarter	(4)
Clinical Diagnostics Ergonomics	BIOEN 539 (Tuesday) Winter Quarter	(4)
Intro to Epidemiology	EPI 511 (Tuesday) Spring Quarter	(4)

Total Credits in Basic Medical Sciences: \_\_\_\_\_

Total Credits in Medical Diagnostics: \_\_\_\_\_

Year 3		
Medical Devices & Commercialization (12 credits)		
Requirement	Enter Year Taken	Grade (Credits)
Medical Device Design	BIOEN 532 (Wed) Fall Quarter	(4)
Reg. Affairs	BIOEN 533 (Wed) Winter Quarter	(4)
Med. Device Comm.	BIOEN 534 (Wed) Spring Quarter	(4)

Year 4		
Biosensors & Biomaterials (12 credits)		
Requirement	Enter Year Taken	Grade (Credits)
Medical Chemistry	BIOEN 535 (Monday) Fall Quarter	(4)
Biosensors	BIOEN 536 (Monday) Winter Quarter	(4)
Biomaterials & Biocompatibility	BIOEN 537 (Monday) Spring Quarter	(4)

Total Credits in Medical Devices & Commercialization: \_\_\_\_\_

Total Credits Biosensors & Biomaterials: \_\_\_\_\_

A		
Bioengineering Department Seminar (min. 4 credits)		
Requirement	Enter Quarter & Year Taken	Grade (Credits)
BIOEN 509	BIOEN 509 Winter[ ] Spring [ ]	
BIOEN 509	BIOEN 509 Winter[ ] Spring [ ]	

B		
Bioengineering Department Seminar		
Requirement	Enter Quarter & Year Taken	Grade (Credits)
BIOEN 509	BIOEN 509 Winter[ ] Spring [ ]	
BIOEN 509	BIOEN 509 Winter[ ] Spring [ ]	

Total Credits in BIOE Department Seminar: \_\_\_\_\_

Total Credits Earned as Graduate Non-Matriculated (GNM): \_\_\_\_\_

Total Credits Earned after Graduate School Admission (MME): \_\_\_\_\_

TOTAL CREDITS EARNED MUST EQUAL 58 (Years 1-4, A-B): \_\_\_\_\_

Any grades lower than 2.7?    Yes            No

Cumulative GPA is greater than or equal to 3.0?    Yes    No

**Note:**

*A minimum of 24 credits **MUST** be earned after acceptance to the degree. A maximum of 12 GNM credits may be applied to the degree.*

## Appendix F: Master's of Medical Engineering (MME) Planning Sheet Thesis Option

Name: \_\_\_\_\_  
 Outreach ID: \_\_\_\_\_  
 UW ID: \_\_\_\_\_

Quarter/Year Admitted to Degree Program: \_\_\_\_\_  
 Quarter/Year Admitted to GNM Status: \_\_\_\_\_

Year 1		
Basic Medical Sciences (18 credits)		
Requirement	Year Taken	Grade(Credits)
Cell Biology Lecture	BSTR 540 (Thursday) Fall Quarter	(4)
Cell Biology Lab	CONJ 585 (Saturday) Fall Quarter	(2)
Physiology Lecture	PBIO 520 (Thursday) Winter Quarter	(4)
Physiology Lab	PBIO 508 (Saturday) Winter Quarter	(2)
Anatomy Seminar	BIOEN 530 (Thursday) Spring Quarter	(4)
Anatomy Lab	BIOEN 531 (Saturday) Spring Quarter	(2)

Year 2		
Medical Diagnostics (12 credits)		
Requirement	Year Taken	Grade(Credits)
Medical Imaging Diagnostics	BIOEN 538 (Tuesday) Fall Quarter	(4)
Clinical Diagnostics	BIOEN 539 (Tuesday) Spring Quarter	(4)
Intro to Epidemiology	EPI 511 (Tuesday) Spring Quarter	(4)

Total Credits in Basic Medical Sciences: \_\_\_\_\_  
 Total Credits in Medical Diagnostics: \_\_\_\_\_

Year 3		
Medical Devices & Commercialization (12 credits)		
Requirement	Year Taken	Grade(Credits)
Medical Device Design	BIOEN 532 (Wednesday) Fall Quarter	(4)
Reg. Affairs	BIOEN 533 (Wednesday) Winter Quarter	(4)
Med. Device Comm.	BIOEN 534 (Wednesday) Spring Quarter	(4)

Year 4		
Biosensors & Biomaterials (12 credits)		
Requirement	Year Taken	Grade(Credits)
Medical Chemistry	BIOEN 535 (Monday) Fall Quarter	(4)
Biosensors	BIOEN 536 (Monday) Winter Quarter	(4)
Biomaterials & Biocompatibility	BIOEN 537 (Monday) Spring Quarter	(4)

Total Credits in Medical Devices & Commercialization: \_\_\_\_\_  
 Total Credits Biosensors & Biomaterials: \_\_\_\_\_

A		
Bioengineering Department Seminar (min. 2 credits)		
Requirement	Quarter/Year Taken	Grade(Credits)
BIOEN 509	BIOEN 509 Winter [ ] Spring [ ]	
BIOEN 509	BIOEN 509 Winter [ ] Spring [ ]	

Total Credits in BIOE Department Seminar: \_\_\_\_\_

B		
Master's Thesis (min. 9 credits)		
Requirement	Quarter/Year Taken	Grade(Credits)
BIOEN 700		
BIOEN 700		
BIOEN 700		
BIOEN 700		

Total Credits in Master's Thesis: \_\_\_\_\_

Total Credits Earned as Graduate Non-Matriculated (GNM): \_\_\_\_\_  
 Total Credits Earned after Graduate School Admission (MME): \_\_\_\_\_  
**TOTAL CREDITS EARNED MUST EQUAL 65 (Years 1-4, A-B): \_\_\_\_\_**

Any grades lower than 2.7?    Yes            No  
 Cumulative GPA is greater than or equal to 3.0?    Yes    No  
*(continued)*



## APPENDIX G: Course Substitution/Waiver Request/ Petition Form

A student should request a **waiver** if he or she has prior coursework (undergraduate or graduate) that fills the requirement. A student should request a **substitution** if he or she seeks permission to substitute another course for a required course. A student should request a **petition** only after receiving instruction and approval from the Academic Counselor. Extenuating circumstances in which a student may petition may include (but are not limited to) requesting part-time Graduate Student Status, requesting on-leave status, or to request individual review relating to any Graduate or Department requirements. Be sure to submit a separate form for *each* waiver, substitution, or petition. Waivers and substitutions are not applicable to students who entered Autumn 2006 or later. Waivers, substitutions, and petitions are subject to the rulings of the SAC and the GPC and are not guaranteed.

**Student's Name:** \_\_\_\_\_ **Date Requested:** \_\_\_\_\_

What degree is the student pursuing?    MS    PhD    MME?

Is this a:     Petition?    Waiver?    or    Substitution?

Course, category, and/or Academic Quarter(s) for which waiver/substitution is requested:

\_\_\_\_\_

Course(s) constituting basis for waiver/substitution (if applicable):

Course # & Title	Date	Credit	Grade	Where Taken*

\* Please attach supporting documentation such as transcripts and syllabi if taken elsewhere.

Rationale for request (please fill out thoroughly for a "petition" request. Include a stapled attachment to this document if you run out of space: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Student's Signature: \_\_\_\_\_

\_\_\_\_\_

**First Year or Research Advisor Signature**

\_\_\_\_\_

**Date**

\_\_\_\_\_

**Instructor Signature\***

\_\_\_\_\_

**Date**

\*Instructor signature indicates recommendation for approval. Instructor signature required for petitions of Biotransport, Medical Measurements, and Bioengineering Principles of Physiology I & II.

**Student Affairs Committee** approved substitution/waiver/petition on \_\_\_\_\_, 20\_\_.

Yes    No

**GPC signature:** \_\_\_\_\_

## APPENDIX H:

# Satisfactory Progress/Scholarship

### Satisfactory Progress

The Graduate Program Coordinator (GPC), the Student Affairs Committee, and the Supervisory Committee share responsibility for monitoring a student's progress.

*Academic progress* is monitored by the GPC, who reviews quarterly schedules, grades and cumulative GPA.

*Progress through the program* is monitored by the Student Affairs Committee, who will determine if a student is meeting defined deadlines for qualifying, general, and final exams (or thesis defense, for Master's students).

*The research advisor and Supervisory Committee monitor research progress.* The advisor will evaluate research progress every quarter for Master's students and once a year for PhD students. The advisor and Supervisory Committee also determine whether any academic misconduct has taken place. If the committee finds that the student's research progress is unsatisfactory, it will recommend to the Student Affairs Committee that the student be warned or placed on academic probation. The Student Affairs Committee will review the recommendation after consulting with the student and advisor.

If it is determined that the student has made unsatisfactory progress, the GPC sends a letter to the graduate school explaining the department's recommendation. The letter clearly details the problems and the steps the student must take to keep from being dropped. Copies go to the student, the advisor, the senior academic counselor and the supervisory committee.

### Scholarship

Graduate students must maintain at least a 3.0 cumulative GPA. (A minimum of 2.7 must be earned in each class counting for the degree.) Each quarter the Graduate School sends the GPC a list of any students whose GPAs have fallen below 3.0. The GPC must recommend an action to the Graduate School (see below). The student will be given specific written recommendations to help him or her regain acceptable academic performance and stature, and academic scholarship will be reviewed at the end of each subsequent quarter until the student's performance is restored to acceptable levels.

### Actions

Possible actions that can be taken by the department are:

1. **No action.** This might be appropriate for a student whose cumulative GPA is below 3.0 for the first time. Nothing appears on the student's record.
2. **Warning.** This might be applied to a student whose cumulative GPA is below 3.0 for a second quarter. Nothing appears on the student's record.
3. **Probation.** The department may place a student on academic probation if the cumulative or quarterly GPA drops below 3.0, if the student withdraws or departs significantly from the required course work, or if there is unsatisfactory research progress. A prior warning is not required to place someone on probation. Probation action appears on the student's permanent Graduate School record.
4. **Final probation.** A student will not be allowed to be on warning and probation for more than 3 quarters (either consecutively or in total). If, at the end of the third quarter, the student is still deficient, the student will be placed on final probation within the first two weeks of the following quarter. If the deficiency is not corrected by the end of the quarter, the student will be dropped from the program.

If, at the end of any probationary or final probationary quarter, the student has corrected any deficiencies to the satisfaction of the Student Affairs Committee and Supervisory Committee, the student will be returned to normal academic standing. Once a student has been on final probation, however, any further deficiencies result in being dropped from the program.

# APPENDIX I: Supervisory Committee

(Submit original to senior academic counselor for Student Affairs Committee review)

Name: \_\_\_\_\_

Student #: \_\_\_\_\_

Today's Date: \_\_\_\_\_

MS

PhD

**Dates:**

Quarter of Entry to BioE: \_\_\_\_\_

Anticipated Quarter of General Exam: \_\_\_\_\_

**Supervisory Committee (all members must print and initial):**

Chair: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

GSR: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

Member: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

Member: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

Member: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

Member: \_\_\_\_\_ Initials: \_\_\_\_\_ Dept: \_\_\_\_\_ Email: \_\_\_\_\_

**Brief description of thesis project:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**For Student Affairs Committee:**     Approved     Not approved

Comments: \_\_\_\_\_

GPC Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Notes:**

- The Supervisory Committee should be established within one quarter after the Qualifying Exam and at least four months before the request for the General Exam is submitted to the Graduate School.
- At least two members of the Supervisory Committee must be on the list of core BIOE faculty.
- The Supervisory Committee must consist of a minimum of four members (three members, all except the Chair, will have voting status). A majority of the Committee members must also be members of the Graduate Faculty. Graduate Faculty status can be checked at <http://www.grad.washington.edu/gradfac/>
- Endorsed Graduate Faculty with affiliate appointments may be appointed to serve as Graduate School Representatives. The student is responsible for securing a Graduate School Representative. A GSR must have Graduate Faculty status and may serve as GSR even if they have adjunct appointments within students' graduate programs or within committee chairs' graduate programs. Further, the GSR committee participation limit has been removed and endorsed Graduate Faculty may accept unlimited GSR appointments. A GSR cannot have a budgetary or personal relationship with the student or Committee chair.

## APPENDIX J: Graduate Student Plan

Submit original to academic counselor for Student Affairs Committee. The Graduate Student Plan **must** be approved no later than one quarter after the Supervisory Committee is established and no later than one quarter before the General Exam.

Name: \_\_\_\_\_

Student #: \_\_\_\_\_

MS

PhD

Old Curriculum  
(Aut'01-Aut'05)

New Curriculum  
(Aut'06 and later)

**Dates:**

Entry: \_\_\_\_\_

Anticipated Completion: \_\_\_\_\_

Today's Date: \_\_\_\_\_

**Supervisory Committee:**

Chair: \_\_\_\_\_

Initials: \_\_\_\_\_

GSR: \_\_\_\_\_

Initials: \_\_\_\_\_ (GSR not required for MS)

Other: \_\_\_\_\_

Initials: \_\_\_\_\_

Other: \_\_\_\_\_

Initials: \_\_\_\_\_

Other: \_\_\_\_\_

Initials: \_\_\_\_\_

**Thrust Area:** \_\_\_\_\_

**Subject of Thesis/Dissertation:**

If you are earning a PhD, do you have a prior Master's degree?     Yes     No

Please list any approved waivers or substitutions:

**Planned Coursework --** please insert the appropriate planning sheet:

- **Appendix C**.....PhD Planning Sheet
  - For students admitted Aut' 06 or later (New Curriculum)
  - For students admitted Aut' 01 – Aut' 05 (Old Curriculum)
- **Appendix D**.....MS Planning Sheet
  - For students admitted Aut' 06 or later (New Curriculum)
  - For students admitted Aut' 01 – Aut' 05 (Old Curriculum)

**For Student Affairs Committee:**

Progress:  Satisfactory     Unsatisfactory

Plan:     Approved     Not approved

GPC Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix K: REQUEST FOR GENERAL EXAMINATION

Date: \_\_\_\_\_ Department: Bioengineering

Student Name \_\_\_\_\_ Student Number: \_\_\_\_\_

The exam is scheduled for:

Time: \_\_\_\_\_

Day: \_\_\_\_\_

Date: \_\_\_\_\_

Location: \_\_\_\_\_

Will the exam include audio/video conferencing?  
Yes  No

**Who will participate via audio/video conference?**

**Student:** N/A **Member(s)** N/A

**If the student will participate via audio/video conference, a proctor letter must be attached to this request form.**

**Place asterisk (\*) next to name of member(s) listed below who will participate via audio/video conference.**

**All members of the supervisory committee must sign this form; however, the exam may be held with the minimum number of members specified in Graduate School Memorandum No. 13.**

*(E-mails and faxed signatures are acceptable if attached to this form.)*

**Supervisory Committee Names (Typed)**

**Signatures**

\_\_\_\_\_  
(Chairperson)

\_\_\_\_\_  
(Graduate School Representative)

\_\_\_\_\_

\_\_\_\_\_

**The original form MUST be submitted to the Graduate Academic Counselor at least 3 weeks before the date of the General Exam.**

(4/09)

## Appendix L: REQUEST FOR FINAL EXAMINATION

Date: \_\_\_\_\_ Department: Bioengineering

Reading Committee members have read an entire draft of the doctoral dissertation written by:

Student Name: \_\_\_\_\_ Student Number: \_\_\_\_\_

Entitled: \_\_\_\_\_  
\_\_\_\_\_

The exam is scheduled for:

Time: \_\_\_\_\_

Day: \_\_\_\_\_

Date: \_\_\_\_\_

Location: \_\_\_\_\_

Will the exam include audio/video conferencing?

Yes

No

**Who will participate via audio/video conference?**

**Student:** \_\_\_\_\_ **Member(s)** \_\_\_\_\_

**If the student will participate via audio/video conference, a proctor letter must be attached to this request form.**

**Place asterisk (\*) next to name of member(s) listed below who will participate via audio/video conference.**

**All members of the supervisory committee must sign this form; however, the exam may be held with the minimum number of members specified in Graduate School Memorandum No. 13.**

*E-mails and faxed signatures are acceptable if attached to this form. E-mails must verify the time, date and location of the exam or will not be considered a valid confirmation.)*

**Supervisory Committee Names (Typed)**

**Signatures**

\_\_\_\_\_  
(Chair)

\_\_\_\_\_  
(Graduate School Representative)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**The original form MUST be submitted to the Graduate Academic Counselor at least 3 weeks before the date of the General Exam.**

(4/09)