DEPARTMENT OF BIOMEDICAL ENGINEERING
Graduate Handbook

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Overview
In addition to undergraduate programs, the Department of Biomedical Engineering offers graduate programs leading to an MS (thesis) or PhD. The department has research specialties ranging from regenerative medicine to orthopedic biomechanics to optics to signal processing. The BME website offers information about specific research areas for the various full time and joint faculty in BME (bme.uakron.edu). To earn an MS degree, students must complete 33 credit hours of study, including 27 credit hours of course work and six credit hours of thesis work. PhD students must complete a minimum of 96 credit hours, including 48 hours of coursework beyond the undergraduate level. PhD students must pass a department qualifying examination, a candidacy examination, and present and successfully defend their dissertation. Research facilities are located in two campus buildings. The main departmental office, teaching facilities, and a few research laboratories are located in Auburn Science and Engineering Center West Tower. The remaining research facilities are located in Olson Research Center.

Graduate studies in BME are designed to be flexible enough to accommodate students with varied backgrounds and to promote an interest in theoretical and applied research while preparing the student for a career in industry, government or academia. Faculty members in the BME Department have strong research programs in a variety of areas and are active participants in the Institute for Biomedical Engineering Research.

Colloquium
The Department of Biomedical Engineering seminars are held throughout the semester. The seminars are presented by students, faculty, and other invited speakers. All full-time graduate students in the Department are required to attend these seminars, and such attendance will be recorded. Full-time graduate students on graduate assistantships are required to take Biomedical Engineering Colloquium (4800:697) for one credit hour each semester on a credit/no credit basis. Repeated absence from the seminars will result in a grade of "no credit". Exemptions from this seminar requirement must be requested by the advisor and approved by the Department Head.

Advisor Selection (both MS and PhD programs)
Beginning the week before classes each semester, new graduate students must talk to all faculty who are taking students regarding that faculty member’s research, expectations, and opportunities (PhD, MS, both). Students will be asked to get a signature from each faculty member they meet with (see attached form). After meeting with faculty, each student should turn in the signature form with a ranking of the labs they would like to work in (they do not need to rank everyone they spoke with, only those they want to work in). The form can be turned in at any time, but must be in by the Friday of the third week of the semester, giving them 4 weeks to meet with faculty. The rankings will be collected and reviewed by the faculty members to best match student rankings and faculty needs.

Financial Support
Assistantships
To be considered for financial aid or assistantships, a student must first apply to the Graduate School and be admitted to the University and the BME Department as a graduate student. Applications for assistantships must be sent to the department to which students are seeking acceptance. Applications for a graduate assistantship should be submitted by February 1 for the Fall semester and September 1 for the Spring semester.

The BME Department offers graduate assistantships (GAs) for a small number of incoming graduate students, typically with Fall admission. These GAs have duties both as teaching assistants (TAs) and
office assistants totaling 20 hr/wk. The GAs are expected to keep track of their time in these duties, and will be reviewed each semester to assure quality TAing and reliability. The stipend in the COE for the 2013 academic year (12 month) is $15,000 for MS students and $19,500 for PhD students. Remission of tuition is also included.

Individual faculty may offer GAs with combined research and teaching duties totaling 20 hr/wk. These duties are set by the faculty member offering those assistantships, and can be withdrawn if adequate progress is not made toward research or teaching goals. The stipend is set by the faculty, but must be at least (AY2013) $13,000 for MS students and $15,000 for PhD students. Tuition remission is also included.

All students on GAs with tuition remission should use the following guideline for credits to take each semester (Fall/Spring/Summer):

<table>
<thead>
<tr>
<th>Case I – student who does not have an MS degree or a direct-admit student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6 year track – 174 credit hours max</strong></td>
</tr>
<tr>
<td><strong>YEAR 1</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case II – student who has an MS degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 year track – 138 credit hours max</strong></td>
</tr>
<tr>
<td><strong>YEAR 1</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>YEAR 1</strong></th>
<th><strong>YEAR 2</strong></th>
<th><strong>YEAR 3</strong></th>
<th><strong>YEAR 4</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>15/15/15</td>
<td>15/15/15</td>
<td>9/9/6</td>
<td>9/9/6</td>
<td>9/9/6</td>
</tr>
</tbody>
</table>

*If a student finishes the PhD in less than 6 years for Case I or less than 4 years for Case II, it is possible to increase the student credit hours in the last year. This requires approval from the Dean’s office.*

Fees and insurance are paid by the student except as noted in the GA handbook.

For University information on GAs, please see the University graduate handbook online at: [http://www.uakron.edu/dotAsset/678001.pdf](http://www.uakron.edu/dotAsset/678001.pdf).

**Evidence of Financial Support**

To cover tuition and living expenses for 12 months (Fall, Spring, and Summer semesters; out of state tuition), students will need approximately $25,400 (in 2013). International applicants should provide the Office of International programs with an original bank statement reflecting the appropriate amount stated herewith; copies of financial documentation will not be accepted. Applicants are encouraged to send the original financial documentation to the Office of International Programs at the same time the application for admission is sent to the Graduate School in order to prevent a delay in the issuance of the Certification of Eligibility. See [http://www.uakron.edu/oip/immigration/new-students/](http://www.uakron.edu/oip/immigration/new-students/) for further information.

**Probation and Dismissal**

The Department of Biomedical Engineering requires that students receive a grade of B or better in each core graduate course. In 2014, these courses are Fundamentals of Biomedical Engineering, Human Physiology, and Biometry. Students who do not receive a grade of B or better can retake courses once. Students in the PhD program who do not receive a grade of B or better may be moved
to the MS program.

Any student whose grade point average falls below 3.0 is considered to be on probation by the Graduate School. In computing the cumulative averages, "D" grades count as 0.0. The Dean of the Graduate Studies and Research, with the approval of the Department Head, may dismiss any student who accumulates six (6) hours of "C+" or below. The accumulation of four hours of "F" will result in mandatory dismissal. Students dismissed from the Graduate School for academic reasons may not be readmitted for one calendar year, and then only if evidence to support reasons for expected improved performance is submitted and found acceptable.

Any student found to have used University facilities, Department of Biomedical Engineering facilities, or those of the associated medical institutions for illegal or unethical activities shall be subject to disciplinary action and possible dismissal under the due process procedures of the College of Engineering and the University.

**Graduation**

To be cleared for graduation, a candidate must have completed all course work, research and thesis/dissertation with a minimum overall grade point average of 3.0 for all graduate credits earned; filed appropriate forms at the Departmental level and an Application for Graduation with the graduation office according to the published schedules of those offices; paid all applicable fees; returned all University keys; and met any other department or university requirements.

**General Information**

*Identification Cards*

Official University of Akron I.D. cards are issued to all students during registration. These should be carried at all times so as to allow for easy identification by security officers and other University personnel. In addition, these cards are required for access to several facilities. Students can also put money on their Zipcards to use on campus and at local restaurants. Lost cards must be immediately replaced to regain access.

*University Closings*

Students, faculty, and staff are not allowed on campus or in campus building when the University is officially closed. The University is closed: Labor Day, Thanksgiving, day after Thanksgiving, Christmas Day, New Year’s Day, Memorial Day, MLK Jr. Day, and July 4th. The University may also close for weather emergencies or other days, particularly between Christmas and New Year’s Day. If any student, faculty, or staff must come to campus, the University Police must be notified in advance (330-972-2911).

*Keys*

Students will obtain keys for the appropriate workspace(s) in Olson or ASEC. Students may also obtain keys to labs with the approval of the lab director. Key requests are made through the department administrator. Once the request has been processed, the student will receive notification that the key is ready and may pick it up from Locking Systems.

Cardswipe access began in 2012 for access to Olson and in 2013 to ASEC. Dr. Willits is the contact to gain access in Olson, and Charlotte LaBelle is the contact to gain access in ASEC.

When the student leaves the department, all keys must be returned to Locking Systems. Failure to comply with this procedure will postpone the granting of degrees and/or final paychecks.
Mail
Student mailboxes are located in the Graduate Student room in Olson. Stamped, outgoing mail may be sent from the Department Office in ASEC. Mail is picked up and delivered daily.

Outside Work
Occasionally, a student holding a GA or other financial assistance from the Department of Biomedical Engineering may want to have additional part-time employment. When this is specifically precluded by the terms of their assistantship or other award, permission to hold outside employment must be obtained from their advisor or the Department Head, whoever is providing their funding. Such employment must not interfere with the fulfillment of any duties or responsibilities of the awarded financial assistance, nor should the ability of the student to make satisfactory academic progress be impaired. Additionally, outside work should not interfere with residency status.

Parking
All graduate students in the department may obtain a parking permit that allows parking in any University parking lot or parking deck area designated for student parking. The fee required for the parking permit will be paid by the Department for students holding tuition scholarships. Application forms are available online.

Security
Because the offices and laboratories in the Department are accessible to anyone gaining access to the building, security is a responsibility that must be shared by all members of the Department of Biomedical Engineering. Most important, all doors must be kept locked when a room is unoccupied. Strangers entering the department should be politely asked for whom they are looking and then escorted to the Departmental office for assistance.

Security officers do not know most occupants of research laboratories and, therefore, occasionally question someone having legitimate business there. Full cooperation is essential in these cases, and the officer should be politely given the information for which he or she asks.

Computers
Students using the computers located in the computer room in the Department of Biomedical Engineering are available via UAnet ID login. Use of these computers by students not enrolled for classes in the Department is strictly prohibited.

Copy Machine
Students are not charged for copies that are for their roles as a teaching assistant. Copy codes may be obtained from the Department Administrator to track copies. Charges may apply for personal copies.

Fax Machine
Students may use the fax machine during regular business hours. A billing for fax machine use shall be given at the end of each month.

Grievances
Grievances are handled according to the Grievance Procedures for Graduate Studies, approved by the Graduate Council, January 31, 1980.
Doctoral Degree Information

Overview & Timeline
The Doctor of Philosophy in Engineering is an interdisciplinary doctoral program offered on a collegiate basis; however, when applying, a student must indicate BME as their primary discipline. The interdisciplinary program provides an engineering doctoral degree, which expands and enhances the student base, stabilizes the critical number of participating faculty, and expands the academic resources available for the doctoral program. A doctoral student must complete 96 credit hours of combined coursework and research credits as specified in their individualized Plan of Study. See Appendix B for the Interdisciplinary Doctoral Degree Forms and Appendix C for the Interdisciplinary Doctoral Degree Procedures.

The Ph.D. Program provides opportunities to conduct independent, contemporary and significant research in biomedical engineering. Students are expected to identify, formulate and analyze research questions using clinical, experimental, and/or theoretical investigation. The Program also develops students' interdisciplinary communication skills, thereby enhancing their ability to interact with other professionals.

Year 0
July: Graduate Course selection & registration
August (week before classes): BME Graduate Orientation

Year 1
August: Classes begin
August – December: Advisor selection
By May: Committee Selection
May: Qualifying Examination
July: Finalize plans for coursework, research, and degree requirements

Year 2
By May: Complete Core and Elective Courses
Proposal Defense (1 yr after qualifier)

Year 3
Research

Year 4
Research

Year 5
2 weeks prior to defense: Public posting of defense date and abstract of dissertation
2 weeks prior to defense: Preliminary copies of dissertation to committee
Dissertation defense

PhD Qualifier
Student should take the qualifier at the end of their 1st year of doctoral study. The purpose of the qualifier is to determine the student has sufficient BME undergraduate knowledge in the following core areas to qualify for doctoral studies:

Topics (Student completes 4 of 5 during the exam):
1. Materials Science
2. Fluid, Heat, & Mass Transfer
3. Mechanics
4. Circuits
5. Signals & Controls

Timing: 3rd Friday after classes end in the Spring semester

It is not anticipated or suggested that the content of an exam touch on all content of each topic. Rather, the qualifier is a means of determining the extent of a student’s undergraduate knowledge and any technical weaknesses. If the student does not demonstrate sufficient knowledge in a topical area from the qualifier, the student will be required to take a graduate course in that area prior to graduation.

PhD Process

Upon arrival the student will meet with graduate committee chair (GCC) and attend any required orientations. The GCC will discuss course options and help develop an appropriate initial plan of study consisting of at most 18 credit hours. Before completion of the initial plan of study the student must identify an interdisciplinary field of study, a dissertation director and form an interdisciplinary doctoral curriculum (IDC) committee.

The chair of the Interdisciplinary Doctoral Committee (IDC) must be in the Department of Biomedical Engineering. Appointment of the IDC chair must be completed by the candidate by the second semester of study (Form: IDC-2). The IDC shall consist of at least five faculty members, of whom at least two members must be from the Biomedical Engineering Department and one from outside the College of Engineering. (Form: IDC-4)

The Plan of Study (IDC-5/6) is established by the IDC in accordance with the following guidelines:

- minimum of 96 total credit hours with a minimum of 48 credits of coursework
- at least 36 credits of the coursework must be at the 600-700 level approved by the IDC
- up to 6 credits could be substituted with 500 level coursework
- minimum of 24 credits within Biomedical Engineering (4800)

The intent of the coursework in the Plan of Study is to provide background necessary to conduct the dissertation research and prepare the student for a career in research. Coursework for other purposes may be included in the Plan of Study only if the IDC Committee deem appropriate. The Plan of Study must include a language requirement as specified by the Interdisciplinary Doctoral Procedures.

Upon completion of the Qualifying Examination, described above, Form IDC-1 must be completed and signed. The Qualifying Examinations is normally offered once a year. It must be taken no later than the end of the student's first year of study. At most one retake of the examination is allowed.

The purpose of the Candidacy Examination is to test the student's ability to conduct independent research. The student must pass the Candidacy Examination composed and administered by the IDC within one year after passing the Qualifying Examination, completing at least 90% of coursework. The student cannot enroll in doctoral dissertation credits before becoming a doctoral candidate upon passing the Candidacy Examination. Typically at the same time, the student must present an acceptable Proposal for Dissertation Research to the IDC. This should be done within one year after passing the Qualifying Examinations. The proposal shall be in written form and given to the IDC Committee at least 14 days prior to the scheduled date of the Dissertation Proposal oral presentation. Upon successful completion of these items, IDC Forms 8, 9, and 10 are to be submitted.
The dissertation must be a scientifically acceptable and comprehensive study whose format meets all accepted standards of the College of Engineering and the IDC. The dissertation defense must be publically announced 2 weeks prior to the date (Form: IDC-11) via email AND postings. Failure to comply with this date may result in delay of the defense. The written dissertation should be given to the IDC at least 14 days prior to the scheduled date of the oral defense. The doctoral candidate must successfully pass this oral defense allowing no "fail" vote from the members of the IDC (Form IDC-12).

Proposal for Dissertation Research Format

The proposal should be written early in the PhD process, as it helps direct the research of the candidate while informing the committee of the expected outcomes. Each proposal should be written within the confines of the format of a NIH R01 proposal. Specifically, these proposals should contain the following sections: Significance, Innovation, and Approach, and be no more than 12 pages (without references). The font size should be no smaller than Arial 10pt and the margins set at 0.5”. The content breakdown will vary depending upon the work.

CHECK-OUT

All students are expected to check-out from their laboratory and from the department. The thesis advisor should specify what is required, but typically includes all laboratory notebooks, data, data analysis, writing (in digital form), and a bound copy of the thesis. All students should consult with their thesis advisor in advance. Once the advisor signs the check out form (GRADUATE STUDENT CHECK-OUT SHEET), the form should be brought around for all departmental faculty to sign. The final departmental approval of degree conferral will not take place without the completed form.
MASTER OF SCIENCE DEGREE POLICIES

Overview & Timeline
The BME Department expects that most students will complete a thesis MS in 2 years. A total of 33 credits, with 6 credits of thesis and 27 credits of courses; your study plan is selected with your advisor. Colloquium is required for every semester of registration with an assistantship.

Year 0
July: Graduate Course selection & registration
August (week before classes): BME Graduate Orientation

Year 1
August: Classes begin
August – September: Advisor ranking
By May: Committee Selection
By August: Proposal Meeting

Year 2
4 weeks prior to defense: Thesis due to committee
2 weeks prior to defense: Public announcement of defense
Thesis Defense
2 weeks post defense: Submit changes to committee

I. SELECTION OF ADVISOR AND ADVISORY COMMITTEE

A. When to Select an Advisor and an Advisory Committee
Graduate students must select an advisor no later than the end of their first semester of full-time graduate study or before the completion of ten (10) graduate credit hours, whichever occurs first, to be eligible for assistantships. The advisor selection process is outlined above and the form is available in the Departmental Forms. The graduate advisory committee should be formed no later than the end of the student's second semester of full-time graduate study or after 16 graduate credit hours, which ever comes first.

B. Choosing your Advisor
The graduate student may select his/her advisor from members of the full-time or affiliated faculty of the department. If an affiliated faculty member is selected as the advisor, a full-time faculty member of the Department of Biomedical Engineering must also be chosen to be the advisor pro forma. Only those faculty holding Graduate Faculty Status I or II may be advisors for Master's students. Students needing assistance in the selection of an advisor should contact the Biomedical Engineering Graduate Committee.

Students must discuss their research interests with all faculty accepting graduate students before selecting an advisor. Time during the first few weeks of the semester should be spent shadowing or rotating in various laboratories. You should not only discuss potential research projects, but also inquire about funding for the project, fellowships, or travel.

C. Advisor Selection Form
The student must file "ADVISOR SELECTION PROCESS" (attached) with the department by end of the third week of the first semester of graduate study. The selection must be approved by the Biomedical Engineering Graduate Committee by the end of the student's first semester of full-time
study or the completion of ten graduate credits (as outlined in Part A).

D. Selection of the Advisory Committee
The advisory committee will be selected by the student in coordination with his/her advisor. The advisory committee shall consist of the student's advisor and at least two other faculty members, both holding Graduate Faculty Status I or II. At least one committee member must be a full-time faculty member of the Department of Biomedical Engineering. At least one additional member may be selected from the full-time, joint, or affiliated faculty of the Department of Biomedical Engineering. Additional members may be added to the committee, as deemed appropriate. The student shall give each committee member a list of the departmental requirements to inform the committee member of their time and effort commitments. The signatures of all Committee members must be recorded on the "ADVISORY COMMITTEE" form (attached). The final membership of the Advisory Committee must be approved by the Biomedical Engineering Graduate Committee at least two weeks prior to the student's proposal meeting.

E. Change of Advisor
Students may change their advisor during their course of study. Should a change of advisor be desired, the student should consult with the Head of the Department or the Biomedical Engineering Graduate Committee. A written request to make the change must be initiated by the student, signed by the student and the current advisor, and forwarded to the Biomedical Engineering Graduate Committee and Department Head for approval.

Should an advisor wish to terminate their advisory role with a student, the advisor should consult with the Department Head. The advisor should then make a written request, signed by the advisor and the student, and forwarded to the Biomedical Engineering Graduate Committee and the Department Head for approval.

Upon approval, the student is free to choose another advisor, and must do so by the end of the semester in which the change is initiated.

F. Change of Membership in the Advisory Committee
Membership in the advisory committee may be changed at any time, as long as the membership selection rules outlined in Part I-D (above) are followed. Members of the committee may resign by stating their wishes, in writing, to the advisor and the student. The advisor or the student may also request a change in the advisory committee and may do so by informing the departing member(s) and the Biomedical Engineering Graduate Committee, in writing. New or additional members may be appointed with approval of the Biomedical Engineering Graduate Committee, typically no later than two months prior to the student's defense.

II. MASTER PLAN OF STUDY
In consultation with the advisor and the advisory committee, each graduate student must develop a "MASTER PLAN OF STUDY" (attached). This form must be signed by the advisor (first), the advisory committee (second), and the Biomedical Engineering Graduate Committee (last) prior to the completion of 20 graduate credits. This form may be modified with the approval of the advisor and the Biomedical Engineering Graduate Committee. The master plan of study must conform with the Master of Science in Engineering curriculum requirements of the Department of Biomedical Engineering (Appendix A). Any courses which are officially waived or any exemptions from the curriculum requirements, must be acknowledged in writing by the student and signed by the course instructor or Department Head and forwarded to the Dean of the Graduate School.

III. DEGREE REQUIREMENTS
A. General Requirements
Students are advised to be familiar with the general and specific requirements for the completion of the Master's degree as contained in the Graduate School Bulletin and this document.

B. Proposal Meeting & Written Format
Each student is required to submit a thesis proposal to their advisory committee prior to the end of the first complete year of graduate study. The proposal shall consist of a written document, submitted to the committee 2 weeks prior to the proposal meeting, and an oral presentation at the proposal meeting. Each proposal should be written within the confines of the format of a NIH R01 proposal. Specifically, these proposals should contain the following sections: Significance, Innovation, and Approach, and be no more than 12 pages (without references). The font size should be no smaller than Arial 10pt and the margins set at 0.5". The content breakdown will vary depending upon the work. The completion of the proposal meeting will be acknowledged by the advisory committee on the "PROPOSAL MEETING" form (attached).

Students should bring the following forms to their proposal meeting:
EVALUATION RUBRIC: M.S. PROPOSAL
MASTER PLAN OF STUDY
PROPOSAL MEETING
BME MS PROCEDURES (TO BE DISTRIBUTED TO ALL COMMITTEE MEMBERS)

Additional committee meetings should be arranged at least once each semester following the proposal meeting to discuss the progress of the research and any additional concerns raised during the course of the research. A minimum of one committee meeting is required, subsequent to the proposal meeting and a minimum of two months prior to the thesis defense.

If a committee member should fail to attend the proposal meeting and/or the additional committee meetings without proper justification, the student and advisor shall decide whether to dismiss the committee member or not. Such a failure to attend the meetings shall be reported, in writing, by the advisor, to the Department Head. This memo shall also be copied and sent to the committee member's Department Head and Dean.

IV. THESIS
A. Style
Instructions for writing a master's thesis, prescribed by the Graduate School and the College of Engineering, are available online at http://www.uakron.edu/dotAsset/678007.pdf. Students should consult a style manual for appropriate style formats. Style manuals are available in the library and in the bookstore. All students should consult with their advisor and/or an outside editor (e.g., Writing Center, http://www.uakron.edu/tutoring/bwc/index.dot) for assistance prior to writing the final version of their thesis for grammar and spelling. Students whose dominant language is not English must also acknowledge the fact that additional time should be allowed for such assistance, and plan accordingly.

B. Timing
The thesis defense must be scheduled no less than six (6) months after the Proposal Meeting. Two weeks prior to the desired defense date, a final version of the thesis must be distributed to each Master's Thesis Committee member for review. The final version of the thesis must be signed and approved by the Thesis Advisor (using attached form) prior to distribution to the committee. Two weeks prior to the defense date, the student must post AND email the time and day of the defense within the Department and in other practical locations around the university. If any committee member requires that substantial corrections/modifications be made to the thesis, the Master's Thesis
Committee will discuss the required changes and agree on a course of action for the student to take, if possible, prior to a scheduled thesis defense.

C. Defense
The thesis defense will consist of an oral presentation of the thesis by the student (30 minutes in length), followed by a question and answer period. Both the presentation and the question period are open to the entire community. Following these sessions, the student and the Master's Thesis Committee shall meet in private to further discuss the thesis.

Students should bring the following forms to their defense:

- LIST OF PRESENTATIONS AND PUBLICATIONS
- MASTER’S THESIS DEFENSE APPROVAL/DISAPPROVAL
- EVALUATION RUBRIC: MS THESIS DEFENSE
- EVALUATION RUBRIC: MS THESIS SIGNATURE PAGE OF THESIS

The student shall then leave the group and the advisory committee will discuss the changes to be made and the results of the thesis defense. The "MASTER'S DEFENSE" form (attached) will then be signed by all committee members, either as "Approval" or "Disapproval", stating that the Candidate has or has not fulfilled all of the Departmental requirements of a Master's Defense. A majority vote of the committee is required to approve the thesis. Should a committee member vote against approval of the Master's Defense, that person shall submit to the Department Head, in writing, their reasons for disapproval. It is the responsibility of the advisor to notify the student of the results of the defense within 24 hours and to communicate any required changes to the thesis. Changes to the thesis may be required prior to acceptance of the document. Acceptance of the thesis document is signified by a signature of the committee member on the thesis signature page.

After the thesis has been successfully defended, the student has two weeks to make all necessary changes to the text of the thesis and to provide any requesting committee member with a final copy of the thesis for review. Should the student not complete these changes, the faculty advisor, reader or Department Head may, at their discretion, require the student to re-defend the thesis. The reader has a maximum of two weeks to identify any further corrections to be made to the thesis prior to final approval. The signature of the reader is then obtained on the signature page of the thesis. Once the reader's signature is obtained, the thesis then is passed on to the Department Head for review and approval. The thesis then proceeds to the Dean of the College of Engineering and then to the Dean of the Graduate School. See the University guidelines for the number of copies required for final submission to the Graduate School. During this review process, the student is advised to take a copy of the final form of the thesis to the Graduate School, where a proof reader will study the format of the document to check for adherence with the University's format guidelines. Thus, a minimum of 4 weeks are required prior to the deadlines provided by the Graduate School to process a thesis after committee approval.

V. CHECK-OUT & FINAL FORMS

All students are expected to check-out from their laboratory and from the department. The thesis advisor should specify what is required, but typically includes all laboratory notebooks, data, data analysis, writing (in digital form), and a bound copy of the thesis. All students should consult with their thesis advisor in advance. Once the advisor signs the check out form (GRADUATE STUDENT CHECK OUT SHEET), the form should be brought around for all departmental faculty to sign. The final departmental approval of degree conferral will not take place without the completed form.
Appendix A: Departmental Forms & GUIDELINES
DEPARTMENT OF BIOMEDICAL ENGINEERING

ADVISOR SELECTION PROCESS

1) Meet with each faculty member who is accepting students (names below) by the Friday of the third week of the semester. At each meeting, obtain a signature from the faculty designating that you had a meeting. NOTE: Names will be updated each semester.

   i. Rouzbeh Amini
   ii. Brian Davis
   iii. Yang Liu
   iv. Marnie Saunders
   v. Hossein Tavana
   vi. Rebecca Willits
   vii. Yang Yun
   viii. Bing Yu
   ix. Christie Zhang
   x. other joint faculty

2) Turn in this form with a ranking of those advisors that you would like to work with by Friday, 5pm of the third week of the semester. You do not have to fill in every slot, nor do you need to list everyone you met with. Only those advisors that you would like to work with should be listed below.

   1st.
   2nd.
   3rd.
   4th.
   5th.

3) Faculty will review the rankings with their own preferences. Students will be notified of the final selections by the end of the 6th week of the semester.
DEPARTMENT OF BIOMEDICAL ENGINEERING

ADVISORY COMMITTEE SELECTION

Student ___________________ Signature _____________

* Committee Member (Advisor): ___________________

Department   [ ] Full-Time   [ ] Joint   [ ] Adjunct   [ ] Outside
Signature ___________________

* Committee Member: ___________________

Department   [ ] Full-Time   [ ] Joint   [ ] Adjunct   [ ] Outside
Signature ___________________

* Committee Member: ___________________

Department   [ ] Full-Time   [ ] Joint   [ ] Adjunct   [ ] Outside
Signature ___________________

* Committee Member: ___________________

Department   [ ] Full-Time   [ ] Joint   [ ] Adjunct   [ ] Outside
Signature ___________________

APPROVED (Associate Chair for Graduate Studies):

__________________________________________

* Your signature verifies that you agree to serve on this student's committee and that you have read a copy of the BMES MS Procedures.
NOTE: When completed, give this form to the Department Secretary
DEPARTMENT OF BIOMEDICAL ENGINEERING

MASTER PLAN OF STUDY

Student ____________________ Signature ____________
Advisor ____________________ Signature ____________

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
<th>Term Taken</th>
<th>Grade</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BME Core (9 – 12 cr)</strong></td>
<td></td>
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</tr>
<tr>
<td>4800:605 Fundamentals of BME</td>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>4800:611 Biometry Physiology</td>
<td>7</td>
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</tr>
<tr>
<td><strong>BME Electives (9 - 12 cr): must be BME (4800) Courses</strong></td>
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<tr>
<td><strong>Approved Electives (6 cr): science, engineering, and mathematics</strong></td>
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<tr>
<td><strong>Thesis (6 cr)</strong></td>
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</tr>
<tr>
<td>4800 699 Thesis</td>
<td>6</td>
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<tr>
<td>4800 699 Thesis</td>
<td>6</td>
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<tr>
<td>4800 699 Thesis</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A total of 21 credits must be 4800 courses. A total of 24 credits must be engineering.

Approval Date ______

APPROVED (Associate Chair for Graduate Studies):

______________________________________________

NOTE : When completed, give this form to the Department Secretary.
DEPARTMENT OF BIOMEDICAL ENGINEERING

PROPOSAL MEETING

Proposal Meeting Date: ______

Student ______ Signature ___________

Thesis Advisor ______________ Signature ___________
Committee Member ______________ Signature ___________
Committee Member ______________ Signature ___________
Committee Member ______________ Signature ___________

Date planned for the next committee meeting: ________

Suggestions & Comments:

NOTE: When completed, give this form to the Department Secretary.
DEPARTMENT OF BIOMEDICAL ENGINEERING

EVALUATION RUBRIC: M.S. PROPOSAL

Candidate Name: ___________________________ Date: ___________________________

Degree/Program Code (program number): 480000MSE

Title of Thesis Proposal: ___________________________

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Does not meet Expectations (1)</th>
<th>Meets Expectations (2)</th>
<th>Exceeds Expectations (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Definition:</strong> Has stated the research problem clearly, providing motivation for the work.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Literature &amp; Previous Work:</strong> Demonstrates sound knowledge of literature and previous work in the area</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Proposed Studies:</strong> Clearly describes the studies that are to be completed, including a timeline for completion, pertaining to problems at the interface of biology, medicine, and engineering.</td>
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</tr>
<tr>
<td><strong>Quality of Written Proposal:</strong> Communicates the proposed studies clearly and professionally in the written proposal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall Assessment:</strong> The assessment of the overall performance of the candidate based on the evidence in the above items.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Name of Examining Committee Member (print): ___________________________

Signature of the Examining Committee Member: ___________________________

Outcomes:

Learning outcomes for MS in Engineering, Biomedical Specialization:

1. A strong foundation of biomedical engineering knowledge that utilizes biological or physiological phenomena from a quantitative and systems perspective.
2. The ability to obtain and statistically analyze quantitative data pertaining to problems at the interface of biology, medicine, and engineering.
3. The ability to effectively communicate original scientific research in biomedical engineering.
DEPARTMENT OF BIOMEDICAL ENGINEERING

MASTER’S THESIS Advisor Approval For Committee Review

Proposed Thesis Defense Date: _____

Student Name: __________

Thesis Advisor Name: __________

APPROVAL
A signature below signifies that Thesis Advisor named above has reviewed the attached Master’s Thesis and approves of its content and style and believes it to be in final form.

Thesis Advisor Signature ________________ Date: _____

NOTE: When completed, attach this form to the thesis copies that are sent to the committee.
DEPARTMENT OF BIOMEDICAL ENGINEERING

MASTER’S THESIS Defense scheduling
This form must be turned into the Department Secretary at least 2 weeks prior to the defense date to allow for proper public advertisement. Attach to this form an advertisement that includes thesis title, student’s name, advisor’s name, date and place of defense, and the thesis abstract. If substantial changes to the thesis are required by any committee member, the defense date may need to be rescheduled.

MS Thesis Defense Date: ____________________

Signature indicates that the Committee Member has received the thesis in final form and the defense date above is agreed upon:

Thesis Advisor: ____________________ Signature: ____________________ Date: __________

Committee Member: ____________________ Signature: ____________________ Date: __________

Committee Member: ____________________ Signature: ____________________ Date: __________

Committee Member: ____________________ Signature: ____________________ Date: __________

NOTE: When completed, give this form to the Department Secretary.
DEPARTMENT OF BIOMEDICAL ENGINEERING

THESIS TITLE

Presented by: MS Candidate Name

In partial fulfillment of the requirements for M.S. in Engineering, Biomedical Concentration

Research Advisor: Research Advisor Name

Abstract:

Insert Abstract Here
DEPARTMENT OF BIOMEDICAL ENGINEERING
LIST OF PRESENTATIONS AND PUBLICATIONS

Candidate Name: 
Date: 

Degree/Program Code (program number): 480000MSE

Title of Thesis:

<table>
<thead>
<tr>
<th>Conference Presentations: Please note the full reference followed by oral or poster presentation format. If none, put NA.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Journal Publications: Please note the full reference followed by ISI 5yr Impact Factor. If none, put NA</th>
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</thead>
<tbody>
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</tr>
</tbody>
</table>

Outcomes:
Learning outcomes for MS in Engineering, Biomedical Specialization:

1. A strong foundation of biomedical engineering knowledge that utilizes biological or physiological phenomena from a quantitative and systems perspective.
2. The ability to obtain and statistically analyze quantitative data pertaining to problems at the interface of biology, medicine, and engineering.
3. The ability to effectively communicate original scientific research in biomedical engineering.
DEPARTMENT OF BIOMEDICAL ENGINEERING

MASTER’S THESIS DEFENSE APPROVAL/DISAPPROVAL

Thesis Defense Date

Student ______
Advisor __________________ Signature ____________________________

APPROVAL
A signature below signifies that candidate named above has successfully passed their thesis defense. NOTE: Signature below does not signify approval of the thesis

Committee Member ____ Signature ______________
Committee Member ____ Signature ______________
Committee Member ____ Signature ______________
Committee Member ____ Signature ______________

DISAPPROVAL
A signature below signifies that candidate named above has not fulfilled all requirements of a Master's Defense. Should a committee member vote against approval of the Master's Defense or Thesis, that person shall submit to the Department Head, in writing, their reasons for disapproval.

Committee Member ____ Signature ______________
Committee Member ____ Signature ______________
Committee Member ____ Signature ______________
Committee Member ____ Signature ______________

NOTE : When completed, give this form to the Department Secretary.
DEPARTMENT OF BIOMEDICAL ENGINEERING

Evaluation Rubric: M.S. Thesis Defense Examination
Candidate Name: Date:
Degree/Program Code (program number): 480000MSE
Title of Thesis:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Does not meet Expectations (1)</th>
<th>Meets Expectations (2)</th>
<th>Exceeds Expectations (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Definition:</strong> Has stated the research problem clearly, providing motivation for the work.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Literature &amp; Previous Work:</strong> Demonstrates sound knowledge of literature and previous work in the area</td>
<td></td>
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<tr>
<td><strong>Results:</strong> Has applied research methods and tools to solve the problem. Has analyzed and interpreted results and data effectively.</td>
<td></td>
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</tr>
<tr>
<td><strong>Quality of Written Thesis:</strong> Communicates research results clearly and professionally in the written thesis.</td>
<td></td>
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</tr>
<tr>
<td><strong>Quality of Oral Defense:</strong> Communicates results clearly and professionally in the oral presentation and independently answers questions in the area of expertise.</td>
<td></td>
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</tr>
<tr>
<td><strong>Overall Assessment:</strong> The assessment of the overall performance of the candidate based on the evidence in the above items.</td>
<td></td>
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</tr>
</tbody>
</table>

Name of Examining Committee Member (print):_____________________________________
Signature of the Examining Committee Member:_____________________________________

**Outcomes:**
Upon successful completion of a MS in Engineering (thesis), a student will be able to:

1. apply master’s level engineering concepts to research a new problem or answer a novel question by using engineering analysis, experimentation, and or computer simulations.
2. effectively communicate all aspects of their research project in both oral and in written form.
DEPARTMENT OF BIOMEDICAL ENGINEERING

EVALUATION RUBRIC: M.S. THESIS

Candidate Name: ____________________________ Date: ____________________________

Degree/Program Code (program number): 480000MSE

Title of Thesis: ____________________________

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Does not meet Expectations (1)</th>
<th>Meets Expectations (2)</th>
<th>Exceeds Expectations (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Definition:</strong></td>
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</tr>
<tr>
<td>Has stated the research problem clearly, providing motivation for the work.</td>
<td></td>
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<tr>
<td><strong>Literature &amp; Previous Work:</strong></td>
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<tr>
<td>Demonstrates sound knowledge of literature and previous work in the area</td>
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<tr>
<td><strong>Results:</strong></td>
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</tr>
<tr>
<td>Has obtained and statistically analyzed quantitative data pertaining to problems at the interface of biology, medicine, and engineering.</td>
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<tr>
<td><strong>Discussion:</strong></td>
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<tr>
<td>Has utilized the literature to put the results in the appropriate context.</td>
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</tr>
<tr>
<td><strong>Quality of Written Thesis:</strong></td>
<td></td>
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</tr>
<tr>
<td>Communicates research results clearly and professionally in the written thesis.</td>
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</tr>
<tr>
<td><strong>Overall Assessment:</strong></td>
<td></td>
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<tr>
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</tr>
</tbody>
</table>

Name of Examining Committee Member (print): ____________________________

Signature of the Examining Committee Member: ____________________________

Outcomes:

Learning outcomes for MS in Engineering, Biomedical Specialization:

1. A strong foundation of biomedical engineering knowledge that utilizes biological or physiological phenomena from a quantitative and systems perspective.
2. The ability to obtain and statistically analyze quantitative data pertaining to problems at the interface of biology, medicine, and engineering.
3. The ability to effectively communicate original scientific research in biomedical engineering.
DEPARTMENT OF BIOMEDICAL ENGINEERING

BME MS Procedures (to be Distributed to all Committee Members)

* Committee Member signs form agreeing to serve on the student's Master's Thesis Committee

* Committee Member agrees to a time and date for the Proposal Meeting and receives a copy of the Student's proposal 2 weeks prior to the scheduled date. Should the committee member miss the scheduled meeting without proper justification, the student and/or their advisor may choose to dismiss the person from the committee and the member's department head and dean will be notified of this absence.

* A minimum of one additional committee meeting shall be scheduled prior to two months before the thesis defense.

* Two weeks before the anticipated defense date, the Committee Member shall receive a copy of the Master's Thesis, in final form. The Thesis should contain the approval of the Thesis Advisor that the content is indeed in final form. The Committee Member has this time to read and comment on the thesis and to recommend changes to the content and style of the document. Should the Committee Member not return the thesis by the defense, the changes requested by that member shall not be mandatory. If the Committee Member feels that the thesis is not ready to be defended or that too many changes are required, that member may request a meeting of the committee to discuss such requirements.

* At the time of distribution of the thesis in final form, which is approved by the Thesis Advisor, a time and date for the Master's Thesis Defense shall be agreed upon by all Committee Members.

* After the completion of the defense, the Committee Member must sign the Master's Thesis Approval form under the heading of APPROVAL or DISAPPROVAL. Should the Committee Member sign under the disapproval heading, he/she must provide, in writing, their reasons for this decision.
COLLEGE OF ENGINEERING PROPOSED THESIS AND DISSERTATION REQUIREMENTS
JUNE 20, 1989

To identify the attributes of the research done in the College of Engineering, the following information must be readily identifiable in all theses and dissertations submitted to the Dean for his signature.

ABSTRACT
What was done?
Why was it done?
How was it done?
What was determined?

INTRODUCTION
Technological Significance
Objectives - Preferably Itemized

CONCLUSIONS
One conclusion for each objective
Preferably Itemized

This information will be extracted and kept on file. If it is not readily identifiable, the thesis or dissertation will be returned for a re-write.
# EVALUATION RUBRIC: PhD Dissertation and Examination

**Candidate Name:**

**Date:**

**Degree/Program Code (program number):** 480000PHD

**Dissertation Title:**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Does not meet Expectations (1)</th>
<th>Meets Expectations (2)</th>
<th>Exceeds Expectations (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Definition:</strong> Research problem stated clearly, provides motivation for work*</td>
<td></td>
<td></td>
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<tr>
<td><strong>Literature and Previous Work:</strong> Is aware of and makes use of relevant literature and previous work to frame the problem and identify uniqueness of the research problem*</td>
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<tr>
<td><strong>Impact of Proposed Research:</strong> Demonstrates the potential value of solution to the research problem in advancing knowledge within the area of study*</td>
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<td><strong>Solution Approach:</strong> Applies appropriate state-of-the-field research methods/tools to solve the defined problem. Applies relevant criteria to validate the research methodology.</td>
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<tr>
<td><strong>Results:</strong> Results are correctly analyzed and valid conclusions drawn.</td>
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</tr>
<tr>
<td><strong>Quality of Written Communication:</strong> Communicates research proposal and results clearly and effectively in the written dissertation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quality of Oral Communication:</strong> Orally communicates complex methods and results clearly and effectively. Able to answer questions in area of expertise and field.</td>
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</tr>
<tr>
<td><strong>Critical Thinking:</strong> Demonstrates capability for independent research in area of study, significant expertise in the area and ability to make original contributions in field.</td>
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<tr>
<td><strong>Publications:</strong> Journal publications have or are anticipated from this research.</td>
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</tbody>
</table>

*May be evaluated in proposal as well as dissertation and defense.

Name of Committee Member (Print): ________________________________

Name of Committee Member (Signature): ____________________________

**Ph.D. Outcomes:** Upon successful completion of the doctoral program in engineering, a student will be able to:

1) Demonstrate advanced proficiency in the chosen engineering discipline.
2) Independently formulate, implement and develop an engineering research project
3) Apply technical expertise and critical thinking to yield original research results
4) Effectively communicate complex technical ideas in both written and oral form
5) Disseminate research results that meet the standards for scholarship in the discipline
Graduate Student Check Out Sheet

Instructions: Obtain signatures of all persons listed below before requesting the Department Head's signature on your Thesis or before leaving the Department.

Student's Name:
Thesis Advisor: _____

Department of Biomedical Engineering Faculty
The student listed above has returned all borrowed books, materials, and has fulfilled any other obligations. NOTE: The thesis advisor should sign first designating that the student has appropriately checked-out of their laboratory.

Dr. Amini __________________  Dr. Liu ____________________
Dr. Verstraete _____________  Dr. Willits __________________
Dr. Saunders _______________  Dr. Yun ___________________
Dr. Reddy _________________  Dr. Zhang __________________
Dr. Tavana _________________  Dr. Yu ____________________
Dr. Davis __________________

Science and Technology Library:
All books have been returned to the library and has paid all fines (attach receipt).

Physical Plant:
All keys that were issued to him/her have been returned (attach receipt for return).

Department of Biomedical Engineering Secretary:
All copying and fax charges have been submitted and a forwarding address.

Secretary

Chair of the Department of Biomedical Engineering:
The student has, if applicable, vacated his/her desk, has terminated student employment jobs, has resigned his/her assistantship, and has completed any other known obligations to the department.

Chair BME ____________________________
(Final Signature)
RULES FOR COMPUTER USAGE  
Department of Biomedical Engineering  
Computer Classroom

The computers in the classroom have been purchased by the Department of Biomedical Engineering to be used by faculty, staff and students of the department. **Use by any other persons is not authorized.**

- **NO food or drink is allowed in the computer room.** If you want to eat or drink, do it outside the room.

- Turn the machines **OFF** when you are finished using them. Use main power switch under the table.

- **Do NOT put illegal copies of software on these machines.** To do so is illegal, immoral and expensive if you get caught.

- Do not load programs which you get from "friends" or over bulletin boards on these machines. This is the usual route for "virus" infestations.

- Do not attempt to "boot" from a disk. This is how viruses get onto the machines.

- Do not put paper on the floor. This causes dirt from the floor to get into the printer mechanisms. Clean up your paper mess when you are finished. This includes the Laser Printer int he rear of the room.

- Do not remove the printer cover. Paper can be removed simply by lifting the cover If you must remove the cover, put it back.

- Keep personal files an programs on your own disk. Do not put your personal files on the hard drive. **These drives will be wiped clean frequently with no warning.**

- Do not modify programs, files or configurations that are on the hard disk.

- Do not unplug equipment or change cable connections at the rear of the computers.

I have read and understand that my privileged use of these computers depend upon adherence to the above regulations. I understand that failure to follow these rules will result in cancellation of these privileges.

Signature: 

Date:
Appendix B: Interdisciplinary Doctoral Forms
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Qualifying Exam Results
IDC-1

Doctoral Student First Name ______________________________________________________

Doctoral Student Middle Name __________________________________________________

Doctoral Student Last Name ____________________________________________________

Department __________________________________________ Empl ID ________________

First Qualifying Exam

Date _______ Hours written ______ Hours oral

Accepted into program ______ Proceed to develop a Plan of Study

Failed ______ Recommend dismissal from program

Failed ______ Re-examination petition approved

Date of Second Qualifying Exam

Second Qualifying Exam

Date _______ Hours written ______ Hours oral

Accepted into program ______ Proceed to develop a Plan of Study

Failed ______ Recommend dismissal from program

APPROVAL SIGNATURES:

Chair, Qualifying Exam Committee__________________________________________ Date________

Department Chair __________________________________________________________ Date________

Associate Dean, Graduate Engineering________________________________________ Date________

DISTRIBUTION:

Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Appointment of Dissertation Director
IDC-2

Doctoral Student First Name _______________________________________________________

Doctoral Student Middle Name __________________________________________________

Doctoral Student Last Name _____________________________________________________

Department ________________________________________________________________ Empl ID _____________

Dr. ___________________________________________________________ is appointed as the

Dissertation Director and Chair of the Interdisciplinary Doctoral Committee for this student.

APPROVAL SIGNATURES:

Department Chair ___________________________________________________________ Date___________

Associate Dean, Graduate Engineering ___________________________________________ Date___________

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Change of Dissertation Director
IDC-3

Doctoral Student First Name ________________________________________________________________

Doctoral Student Middle Name ____________________________________________________________

Doctoral Student Last Name ______________________________________________________________

Department __________________________________________________________ Empl ID _____________

Dr. ________________________________________________________ is appointed as the
Dissertation Director and Chair of the Interdisciplinary Doctoral Committee for this student
and replaces Dr. _________________________________________ in this capacity.

APPROVAL SIGNATURES:

Department Chair ________________________________________________________________ Date________

Associate Dean, Graduate Engineering ________________________________________________ Date________

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
**College of Engineering**  
**INTERDISCIPLINARY DOCTORAL PROGRAM**  
**Dissertation Committee Membership**  
**IDC-4 ENGR**

Doctoral Student First Name ____________________________________________________________  
Doctoral Student Middle Name ________________________________________________________  
Doctoral Student Last Name _________________________________________________________  
Department ____________________________ Empl ID _____________

<table>
<thead>
<tr>
<th>Committee Member</th>
<th>Department</th>
<th>Grad Fac cat.</th>
<th>Grad Schl use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Faculty in student’s home dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Faculty in student’s home dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Faculty in student’s home dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Faculty within Engineering but outside student’s home dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Faculty outside of Engineering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Additional Member</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All doctoral committees shall have a minimum of five (5) committee members.
- Committee positions 1, 2, and 3 are filled with Engineering faculty in the student’s home department.
- Committee position 4 is filled with an Engineering faculty member outside the student’s home department. This member ought to be selected so as to be maximally beneficial to the student in the design and conduct of the research, providing a perspective from a related discipline.
- Committee position 5 is filled with a faculty member from outside the College of Engineering. Graduate faculty category II status is required.

At the discretion of the Committee Chair or the Graduate Dean the committee may consist of additional members.

At the time the doctoral committee is constituted the Committee Chair shall send the entire committee membership to the Graduate School for ratification and approval. If there are any changes to the committee membership thereafter, the Committee Chair shall send a revised committee membership list to the Graduate School for further ratification and approval.

**APPROVAL SIGNATURES:**

Department Chair ___________________________ Date__________  
Associate Dean, Graduate Engineering ____________________________ Date__________  
Dean, Graduate School __________________________________________ Date__________

**DISTRIBUTION:**
Student  
Dissertation Director  
Department Chair  
Associate Dean, Graduate Engineering  
Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Dissertation Committee Membership
IDC-4 APPLIED MATH

Doctoral Student First Name ____________________________________________________________

Doctoral Student Middle Name _________________________________________________________

Doctoral Student Last Name ____________________________________________________________

Department ___________________________________________ Empl ID ______________

<table>
<thead>
<tr>
<th>Committee Member</th>
<th>Department</th>
<th>Grad Fac cat.</th>
<th>Grad Schl use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Applied Math Faculty</td>
<td>Applied Math</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>2 Applied Math Faculty</td>
<td>Applied Math</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>3 Applied Math Faculty</td>
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<td>4 Engineering Faculty</td>
<td>Applied Math</td>
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<td>5 Engineering Faculty</td>
<td>Applied Math</td>
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<tr>
<td>6 Engineering Faculty</td>
<td>Applied Math</td>
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<tr>
<td>7 Additional Member</td>
<td>Applied Math</td>
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</table>

All Applied Math doctoral committees shall have a minimum of six (6) committee members including the committee chair:
(3) Applied Math faculty who have a joint appointment in the College of Engineering.
Graduate faculty category II status is required.
(3) Engineering faculty

At the discretion of the Committee Chair or the Graduate Dean the committee may consist of additional members.

At the time the doctoral committee is constituted the Committee Chair shall send the entire committee membership to the Graduate School for ratification and approval. If there are any changes to the committee membership thereafter, the Committee Chair shall send a revised committee membership list to the Graduate School for further ratification and approval.

APPROVAL SIGNATURES:

Department Chair ___________________________________________ Date ________

Associate Dean, Graduate Engineering _____________________________ Date ________

Dean, Graduate School _________________________________________ Date ________

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Plan of Study Course List
IDC-6

Doctoral Student First Name ________________________________________________________________

Doctoral Student Middle Name ___________________________________________________________

Doctoral Student Last Name ______________________________________________________________

Department ___________________________________________________ Empl ID _____________

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Semester Credits</th>
<th>Grade / Transfer**</th>
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</table>

Total Semester Credits __________

** A student who has a master's degree from another university or from one of the departments in the College of Engineering may, upon recommendation of the Interdisciplinary Doctoral Committee, transfer up to 24 credits of course work. The courses comprising the transfer credits must be identified and itemized on the Plan of Study and must be substantiated by an official transcript from the educational institution that offered the courses.

A student who has completed a non-thesis master’s degree, or has graduate credits but has not completed the degree requirements for the master’s degree, can transfer a maximum of 24 credits of course work toward the doctoral course requirements.

No more than six (6) credit hours of research or completed thesis credits can be transferred.

APPROVAL SIGNATURES:

Dissertation Director ___________________________________________________ Date __________

Associate Dean, Graduate Engineering ___________________________________________ Date __________

DISTRIBUTION:

Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Candidacy Exam Results
IDC-7

Doctoral Student First Name ____________________________________________________________

Doctoral Student Middle Name _________________________________________________________

Doctoral Student Last Name ___________________________________________________________

Department ___________________________________________________________ Empl ID _____________

First Candidacy Exam

__________ Date
____Pass
_____ Fail

Re-examination petition approved
___________ Date of Second Candidacy Exam
_____ Fail
_____ Recommend dismissal from program

Second Candidacy Exam

__________ Date
____ Pass
_____ Fail

Recommend dismissal from program

Committee Members

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

APPROVAL SIGNATURES:

Dissertation Director __________________________________________________________ Date__________

DISTRIBUTION:

Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Status of Academic Requirements
IDC-8

Doctoral Student First Name ________________________________________________________
Doctoral Student Middle Name ____________________________________________________
Doctoral Student Last Name ______________________________________________________
Department ____________________________________________________ Empl ID ____________
Degree/Program Code (example: 445000PHD) _________________________________

IDC-1 Qualifying Exam passed (date) ______________________________
IDC-6 Plan of Study accepted (date) ________________________________
IDC-7 Candidacy Exam passed (date) ________________________________
Language satisfied by (specify) ________________________________________________

Plan A ________ Plan B ________ Plan C ________

APPROVAL SIGNATURES:

Dissertation Director ________________________________________________________ Date __________
Associate Dean, Graduate Engineering ________________________________ Date __________

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
An acceptable Dissertation Proposal (attached) has been submitted to the Interdisciplinary Doctoral Committee.

Committee Recommendations

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

Committee Member Signatures

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

APPROVAL SIGNATURE:

Dissertation Director___________________________________________________________ Date__________

DISTRIBUTION:

Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Notice of Dissertation Defense
IDC-11

Doctoral Student First Name

Doctoral Student Middle Name

Doctoral Student Last Name

Department Empl ID

This doctoral candidate is prepared to defend his dissertation entitled

on:

Date

Time

Room

The doctoral student will furnish a copy of the dissertation to the committee members.

Committee Members

APPROVAL SIGNATURE:
Dissertation Director Date

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering

Revised 2013 Jan 02
College of Engineering
INTERDISCIPLINARY DOCTORAL PROGRAM
Dissertation Defense Result
IDC-12

Doctoral Student First Name ______________________________________________________________

Doctoral Student Middle Name __________________________________________________________

Doctoral Student Last Name _____________________________________________________________

Department ___________________________________________ Empl ID ________________

__________________________ Date of dissertation defense

_____ Successfully defended
(No more than one “fail” vote was recorded, and no “fail” votes from the College of Engineering were recorded.)

_____ Unsuccessfully defended
(More than one “fail” vote was recorded).

The members of the doctoral dissertation committee hereby record and attest to the above:

Committee Chair / Dissertation Director _____________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Committee Member _______________________________________________________________ pass _____ fail

Outside Committee Member _________________________________________________________ pass _____ fail

APPROVAL SIGNATURE:

Associate Dean, Graduate Engineering_______________________________________________ Date__________

DISTRIBUTION:
Student
Dissertation Director
Department Chair
Associate Dean, Graduate Engineering
Dean, Graduate School

Revised 2013 Jan 02
Appendix C: Interdisciplinary Doctoral Procedures
INTERDISCIPLINARY DOCTORAL PROCEDURES
COLLEGE OF ENGINEERING
THE UNIVERSITY OF AKRON

FEBRUARY 2001
INTERDISCIPLINARY DOCTORAL PROCEDURES
COLLEGE OF ENGINEERING

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APPENDIX: INTERDISCIPLINARY DOCTORAL FORMS

IDC-1  Qualifying Exam Results
IDC-2  Appointment of Dissertation Director
IDC-3  Change of Dissertation Director
IDC-4  Doctoral Dissertation Committee Membership
IDC-5  Plan of Study
IDC-6  Plan of Study Course List
IDC-7  Candidacy Examination Results
IDC-8  Status of Academic Requirements
IDC-9  Cover Letter for Advancement to Candidacy
IDC-10 Dissertation Proposal
IDC-11 Schedule of Dissertation Defense
IDC-12 Doctoral Dissertation Defense Report

Note: The doctoral requirements of The University of Akron are italicized to distinguish the University’s requirements from those of the College of Engineering
INTERDISCIPLINARY DOCTORAL PROCEDURES
COLLEGE OF ENGINEERING
UNIVERSITY OF AKRON

College of Engineering’s Graduate Degrees

The graduate degrees offered in the College of Engineering are summarized in Table 1. Coordinated programs are those that are both an interdisciplinary program in the College of Engineering and a department at The University of Akron.

Table 1. Graduate Degrees Offered in the College of Engineering at The University of Akron

<table>
<thead>
<tr>
<th>DOCTOR OF PHILOSOPHY IN ENGINEERING DEGREE</th>
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<tbody>
<tr>
<td>Interdisciplinary Programs</td>
</tr>
<tr>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>Mechanics</td>
</tr>
<tr>
<td>Systems Engineering</td>
</tr>
<tr>
<td>Materials Engineering</td>
</tr>
<tr>
<td>Transport Processes</td>
</tr>
<tr>
<td>Biomedical Engineering*</td>
</tr>
<tr>
<td>Polymer Engineering*</td>
</tr>
<tr>
<td>Engineering Applied Mathematics*</td>
</tr>
<tr>
<td>*Coordinated Programs</td>
</tr>
<tr>
<td>Biomedical Engineering with the Biomedical Engineering Department in the College of Engineering</td>
</tr>
<tr>
<td>Polymer Engineering with the Polymer Engineering Department in the College of Polymer Science and Polymer Engineering</td>
</tr>
<tr>
<td>Engineering Applied Mathematics with the Department of Mathematical Science in the College of Arts and Sciences</td>
</tr>
<tr>
<td>College of Engineering at The University of Akron and the College of Engineering at Youngstown State University</td>
</tr>
</tbody>
</table>

Joint Program
MD/Doctor of Philosophy in Engineering Degree with Northeastern Ohio Universities’ College of Medicine (NEOUCOM)

MASTER OF SCIENCE DEGREES

Master of Science in Chemical Engineering
Master of Science in Civil Engineering
Master of Science in Electrical Engineering
Master of Science in Mechanical Engineering

Master of Science in Engineering
  Biomedical Specialization
  Polymer Specialization
  Engineering Management Specialization
Doctoral Student’s Responsibilities

Doctoral students are completely responsible for all aspects of their graduate education. Specifically, their responsibilities include:

- Understanding, adhering to, and implementing the procedures of the Graduate School, as described in The University of Akron Graduate Bulletin and the Interdisciplinary Doctoral Procedures of the College of Engineering.
- Selecting an interdisciplinary program, Dissertation Director, and Interdisciplinary Doctoral Committee.
- Arranging, through the Dissertation Director, all Interdisciplinary Doctoral Committee meetings.
- Initiating, through the Dissertation Director, the forms that monitor their progress toward the doctoral degree.
- Proposing and executing an accepted Plan of Study.
- Proposing a Research Proposal and executing the proposed research.
- Preparing a scientifically acceptable and comprehensive dissertation whose format meets all the accepted standards of the Interdisciplinary Doctoral Committee, the College of Engineering, and the Graduate School.

Graduate Assistantships

The Acceptance Agreement for the Graduate Assistants at The University of Akron states that the Appointee shall be enrolled in a full-time program of graduate study at The University of Akron. Full-time study is defined as 9-15 graduate credit hours.

Admission Procedures

All applicants for the doctoral program in the College of Engineering must submit their applications and supporting documentation to the Graduate School. When the documentation is complete, the Graduate School sends it to the Dean of the College of Engineering, who then distributes it to the departments for their evaluation and recommendations concerning acceptance or rejection. The documentation and recommendations are returned to the Graduate School via the Dean of the College of Engineering. The Graduate School then sends the letter of acceptance or rejection to each applicant.

Admission Requirements

Applicants for the Doctor of Philosophy in Engineering must hold a bachelor’s degree from a program that is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology at the time of graduation, or provide satisfactory evidence of an equivalent academic background to the Dean of the College of Engineering.

Applicants with a Master of Science degree must provide satisfactory evidence of an equivalent engineering baccalaureate background to the Dean of the College of Engineering.

Applicants must submit official undergraduate transcripts, undergraduate grade point average, at least two letters of recommendation, and official results of the verbal, quantitative, and analytical portions of the GRE. Personal statements or descriptions of post-baccalaureate experience that provide a rationale for the proposed graduate study may also be submitted.

Applicants with a bachelor’s degree must have a cumulative grade point average of at least 3.0/4.0.

Applicants with a master’s degree must have a cumulative grade point average of at least 3.5/4.0.

Applicants whose native language is not English must have a TOEFL score of at least 550 (written test) or a score of at least 213 (computerized test), and also must submit their score on the Test of Written English.
Applicants not satisfying the requirements for Full Admission may be classified either as a Professional Admission or as a Deferred Admission. Applicants with a bachelor’s degree in a discipline other than engineering shall have completed undergraduate coursework in calculus, differential equations, and have one year of classical physics. These students may be required to take additional bridge-up courses depending on their background. Necessary bridge-up coursework will be determined by the graduate committee of admitting department or program.

Residency Requirement

The minimum residency requirement for a doctoral candidate is at least two consecutive semesters of full-time study in the program. Full-time study is defined as 9-15 semester graduate credits, except for graduate teaching and research assistants for whom full-time study is specified by the assistantship agreement. No student holding a full-time job is considered as fulfilling the residence requirement. The summer sessions may count as one semester, provided that the doctoral student is enrolled for a minimum of 10 consecutive weeks of full-time study and for a minimum of six semester credits per five-week session.

Time Limit

All doctoral requirements must be completed within 10 years of matriculation for doctoral studies.

Transfer Credits

A student who has a master’s degree from another university or from one of the departments in the College of Engineering may, upon recommendation of the Interdisciplinary Doctoral Committee, transfer up to 24 credits of coursework. The course comprising the transfer credits must be identified and itemized on the Plan of Study and must be substantiated by an official transcript from the educational institution that offered the courses.

A student who has completed a non-thesis master’s degree, or has graduate credits but has not completed the degree requirements for the master’s degree, can transfer a maximum amount of 24 credits of coursework toward the doctoral course requirements.

No more than six credit hours of research or completed thesis credits can be transferred.

Doctoral Degree Requirements

The University’s Academic Requirements (See Academic Requirements in the Graduate Bulletin) for the Doctoral Degree and the College of Engineering’s Academic Requirements for the Doctoral Degree must be satisfied.

- Pass a departmental Qualifying Examination. The purpose of the qualifying examination is to determine admissibility to the doctoral program and any technical weaknesses.
- Identify an interdisciplinary field of study, a dissertation director, and an Interdisciplinary Doctoral Committee (IDC) before completion of 18 credits of coursework. The chair of the IDC will be in the student’s home department.
- Complete a formal Plan of Study that is acceptable to the IDC. The plan of study should include 96 credit hours of combined coursework and research credits in accordance with the guidelines established by the student’s admitting department/program.
- Satisfy the language requirement specified by the Interdisciplinary Doctoral Committee.
- Pass a Candidacy Examination. The purpose of the candidacy examination is to test the student’s ability to conduct independent research.
- Present an acceptable Dissertation Proposal that describes the proposed research to the Interdisciplinary Doctoral Committee.
- Present and successfully (no “fail” votes) defend the dissertation to the Interdisciplinary Doctoral Committee.
A copy of the Ph.D. in Engineering Program Procedures may be obtained from the office of the Dean of the College of Engineering.

Qualifying Examination

The student must pass a Qualifying Examination before the Dissertation Director, the Interdisciplinary Committee, and the courses for the Plan of Study are selected. The objective of the Qualifying Examination is to determine if the student has sufficient engineering background to qualify for doctoral studies.

To ensure an equitable basis for evaluation, the Qualifying Examination shall be taken by all first-year graduate students and must be a common written departmental examination.

Each department shall have a graduate committee composed of departmental graduate faculty representing each of the interdisciplinary programs in the department. This departmental graduate committee advises graduate students prior to the selection of a Dissertation Director; the committee also develops, administers, and grades the Qualifying Examination for those graduate students whose professional identity or undergraduate degree is in the discipline of the department. The Qualifying Examination may be given in September, January, and/or May of each academic year.

If the student fails the Qualifying Examination, the student may petition the Qualifying Examination committee for re-examination. One re-examination is permitted. The second examination must be taken at the regularly scheduled time for that department’s Qualifying Examination. If the student fails the second Qualifying Examination along with the recommendation that the Dean of the Graduate School dismiss the student from the doctoral program in the College of Engineering.

Any graduate student who does not take or pass the Qualifying Examination in the first year of graduate study may be dismissed from the doctoral program, and if on an assistantship, shall not receive any further assistantship support.

Dissertation Director

The Dissertation Director must be identified before completion of 18 credits of coursework. Any graduate who does not select a Dissertation Director accordingly may be dismissed from the doctoral program and, if on an assistantship, shall not receive further assistantship support.

Interdisciplinary Doctoral Committee (IDC)

After choosing the Dissertation Director, an Interdisciplinary Doctoral Committee is formed. The Interdisciplinary Doctoral Committee shall consist of a minimum of five full-time faculty member with a minimum of three from the College of Engineering and at least one from outside the College of Engineering.

The outside member of the committee shall function as a regular member of the committee, attending all meetings and receiving preliminary drafts or chapters as do other committee members. The outside member of the committee is usually someone who may provide additional expertise to the dissertation research from a related field, and is also someone who assures that the dissertation process is conducted fairly and that quality standards are maintained. The schedules of all committee members, including the outside member, shall be considered when selecting a time for all committee meetings, including the final dissertation defense.

At the discretion of the doctoral advisor or the Graduate Dean, additional members may be appointed.

At the time the doctoral committee, including the outside representative, is constituted, the doctoral adviser shall send the entire committee membership through the College of Engineering to the Graduate School for ratification and approval. This notification of the entire committee membership should be received in the Graduate School at the time the committee is constituted, prior to the prospectus meeting, normally at least six (6) months prior to the dissertation defense, and must be received in the Graduate School no later than a minimum of three (3) months prior to the dissertation defense.
If there are any changes to the committee membership after the initial appointment by the Graduate School, the doctoral adviser shall send revised committee membership to the Graduate School for ratification and approval of any changes. Requests for changes in committee membership should include the reason for the change.

Of the three members from the College of Engineering, one must be from a department different from that of the Dissertation Director and all three must have attained that graduate faculty status, as specified by the Graduate School, which permits the direction of doctoral students. The member from outside the College of Engineering also must have a status on the graduate faculty, which allows him/her to direct doctoral dissertations. This member ought to be selected so as to be maximally beneficial to the student in the design and conduct of the research, providing a perspective from a related discipline. A majority of the committee membership must have a status on the graduate faculty, which allows them to direct doctoral dissertations and a majority of the Interdisciplinary Doctoral Committee must be from the College of Engineering, except for the Joint Program with the Department of Mathematics and Computer Science.

Adjunct faculty may be on the Interdisciplinary Doctoral Committee but must be in addition to the minimum of five full-time faculty members on the Committee.

Voting privileges are limited to the full-time faculty on the Committee.

Any graduate student who does not form an Interdisciplinary Doctoral Committee in the first year of doctoral study may be dismissed from the doctoral program and, if on an assistantship, shall not receive further assistantship support.

The doctoral student may change the membership of the Interdisciplinary Committee or the Dissertation Director anytime before the Plan of Study is submitted to the Interdisciplinary Doctoral Committee. After that, the doctoral student must submit a written petition to and obtain written approval from the Dean of the College of Engineering to alter the membership of the Interdisciplinary Doctoral Committee or to change the Dissertation Director.

The Interdisciplinary Doctoral Committee has authority over the individualized study and the academic standard for the doctoral student. The Dean of the College of Engineering is responsible for determining that all of the University’s degree requirements are met.

For graduate students participating in Coordinated Programs, please see that section of these procedures.

Plan of Study

After consultation with the Dissertation Director, the doctoral student shall formally present a Plan of Study to the Interdisciplinary Doctoral Committee for recommendations and acceptance. Academic activity pursued prior to the selection of a Dissertation Director and the formation of the Interdisciplinary Doctoral Committee may not be accepted by the Committee.

The courses listed on the Plan of Study constitute the individualized curriculum that the doctoral student must satisfy to meet the course requirements for the doctoral degree. Since the Plan of Study is individualized, it may contain more credits than the minimums specified in the doctoral requirements.

Any graduate student who does not have an approved Plan of Study in the first year of doctoral study may be dismissed from the doctoral program and, if on an assistantship, shall not receive further assistantship support.

Credit Requirements

Thesis, dissertation, and preliminary research hours are to be given credit/non-credit grades. Full-time study is defined as 9-15 semester credits.

The minimum total credit hours for the doctoral program is 96 credit hours.
Language Requirement

To determine the student’s ability for self-instruction, the Interdisciplinary Doctoral Committee may require the student to demonstrate proficiency in a foreign language.

The language options approved by the University are:

- **Plan A:** Reading knowledge with the aid of a dictionary, of two approved foreign languages. At the discretion of the major department an average of “B” in the second year of a college-level course in a language will be accepted as evidence of proficiency in reading knowledge for that language. English may be considered as one of the approved foreign languages for a student whose first language is not English. Demonstrated competence in a research technique (e.g., statistics and/or computers) may be substituted for one of the two foreign languages. Under the last option, each department should define competence and publicize.

- **Plan B:** Comprehensive knowledge of one approved foreign language, including reading without the aid of a dictionary, and such additional requirements as the department may impose.

- **Plan C:** In certain doctoral programs (counseling and guidance, elementary education, engineering, psychology, secondary education) the demonstration of competence in appropriate research skills may serve as a substitute for the foreign language requirement.

Candidacy Examination

The purpose of the Candidacy Examination is to permit the doctoral student an opportunity to demonstrate:

- Depth and detailed knowledge of fundamental scientific and engineering principles, especially those obtained from the courses in the Plan of Study.
- A comprehensive and mature understanding of the relevance and technological significance of the interdisciplinary field of study.
- Sufficient academic skills to be able to perform independent, original, and scholarly investigations.
- Sufficient oral and written communication skills to be able to report the results of the original investigations.

The Candidacy Examination shall be prepared and administered by the Interdisciplinary Doctoral Committee. The Interdisciplinary Doctoral Committee shall have the flexibility to combine, as it sees fit, the Candidacy Examination and the Dissertation Proposal.

After the student passes the Candidacy Examination, the Doctoral student becomes a doctoral candidate. The doctoral candidate, through the Dissertation Director and Dean of Engineering, submits the Cover Letter for Advancement to Candidacy form to the Dean of the Graduate School.

If the doctoral student fails the Candidacy Examination, the doctoral student may submit a written petition to the Interdisciplinary Doctoral Committee for a re-examination. If the Committee concurs with the student’s petition, then one re-examination is permitted within the time period specified by the Interdisciplinary Doctoral Committee.

If the Interdisciplinary Doctoral Committee rejects the petition for re-examination, or the student fails the re-examination, then the Dissertation Director shall notify the Dean of Engineering, in writing, that the student has failed the Candidacy Examination. The Dean of Engineering shall recommend to the Dean of the Graduate School that the student be dismissed from the doctoral program in engineering.

Advancement to Candidacy forms must be submitted no later than May 15 for the December commencement and no later than September 15 for the May commencement. These forms are available in the office of the Dean of the Graduate School or in the academic department.
Dissertation Proposal

The Dissertation Proposal provides a formal record of the interaction between the doctoral student and the Interdisciplinary Doctoral Committee concerning the proposed investigations. The Dissertation Proposal is a written description of the proposed research and should at least include a review of the previous work in this area, the significance of the investigations, the objectives, the methodology, and the expected results.

The Committee must also evaluate the doctoral student’s ability to communicate the results of the investigations. The response of the Committee to the dissertation proposal must include written recommendations to the doctoral candidate concerning the above listed criteria together with comments on the organization, style, neatness, grammar, and clarity of presentation.

The Dissertation Proposal and the Interdisciplinary Doctoral Committee’s written recommendations become part of the student’s file in the College of Engineering.

The Dissertation Proposal must follow the format specified in the latest edition of the Guidelines for Preparing a Thesis or Dissertation.

Dissertation and Oral Defense

The ability to do independent research and demonstrate competence in scholarly exposition must be demonstrated by the preparation of a dissertation on some topic related to the major subject. It should represent a significant contribution to knowledge, be presented in a scholarly manner, reveal the candidate’s ability to do independent research, and indicate experience in research techniques.

The doctoral dissertation committee supervises and approves the dissertation and administers an oral examination on related areas of study. This examination is open to the graduate faculty. The dissertation and oral examination must be approved by the committee before the dissertation is submitted to the Graduate School. Two copies of the dissertation are due in the Graduate School at least two weeks prior to commencement. The copies must be signed by the advisor, department chair, and college dean prior to submission to the Dean of the Graduate School. A manual entitled Guidelines for Preparing a Thesis or Dissertation is available in the Graduate School and all copies of the dissertation must conform to these instructions.

The doctoral candidate distributes complete, but preliminary copies of the dissertation to each member of the Interdisciplinary Doctoral Committee at least two weeks prior to the Dissertation Defense.

At the opening of the Dissertation Defense, the doctoral candidate makes an oral presentation of the dissertation. The Interdisciplinary Doctoral Committee evaluates the presentation and examines the candidate to determine that the investigation meets scholarly standards that are appropriate for the doctoral degree.

At the end of the final defense, all committee members shall be polled for their vote on the defense and the dissertation (pass or fail). All committee members shall affix their signatures to a single form signifying their vote. The form shall be sent to the Graduate School as the single form indicating that the defense has been held, and that the student has passed or failed. This form must be on file in the Graduate School at the time the dissertation is officially submitted. No “fail” votes are permitted in the College of Engineering.

The student, along with the dissertation advisor and the entire committee, bear responsibility for the content and form of the dissertation being acceptable.

If any member of the Interdisciplinary Doctoral Committee is not satisfied with any aspect of the dissertation or the defense, this member is required to communicate the reasons for the dissatisfaction to the Dean of Engineering.

If individual members of the committee, including the outside representative, wish to write separate memos to the Graduate School concerning the dissertation and/or the defense, they are invited (but not required) to do so.

The doctoral candidate incorporates the recommendations and corrections of the Interdisciplinary Doctoral Committee into the dissertation and then prepares the final draft of the dissertation. The format
for both the dissertation proposal and the dissertation must conform to accepted professional standards and
to the specifications of the Graduate School’s manual, Guidelines for Preparing a Thesis or Dissertation.

A total of five copies of the completed and signed dissertation are required; two for the Graduate
School, one for the department, one for the Dissertation Director, and one for the doctoral candidate. The
five required copies of the dissertation are submitted to the College of Engineering for approval by the
Dean of the College of Engineering. A copy of the abstract is placed in the candidate’s file and then the
five copies are returned to the candidate, who shall deliver them to the Graduate School.

The signature sheet of the final draft of the dissertation shall be signed by the Dissertation
Director, the department chair, and the Dean of the College of Engineering, as well as the Dean of the
Graduate School. Since the position of “reader” is eliminated, there shall be no such signature required.

The candidate shall ascertain that a copy of the abstract of the dissertation is sent to Dissertation
Abstracts.

Coordinated and Joint Programs

**Coordinated Engineering Applied Mathematics program for the Doctor of Philosophy in Engineering Degree between the College of Engineering and the Applied Mathematics Division of Department of Theoretical and Applied Mathematics (formerly Department of Mathematics and Computer Science)**

The faculty in the College of Engineering and the Department of Mathematics and Computer
Science have agreed to provide a coordinated program, subject to the following conditions, for those
graduate students who elect the interdisciplinary field of Engineering Applied Mathematics.

### Admission Requirements

Applicants for the Engineering Applied Mathematics Program must have their graduate
application and credentials evaluated by the College of Engineering Dean’s Office and the Department of
Mathematics and Computer Science. The Admission Requirements for the Doctor of Philosophy in
Engineering, as given in the *Graduate Bulletin*, shall apply to all applicants for the Engineering Applied
Mathematics Program.

### Degree Requirements

The applicable Degree Requirements for the Engineering Applied Mathematics Program are those
given in the *Graduate Bulletin* under the Section **Doctor of Philosophy in Engineering**. These degree
requirements include passing a Qualifying Examination, identifying a Dissertation Director, establishing an
Interdisciplinary Doctoral Committee, completing a formal Plan of Study, satisfying the University’s
language requirement and residency requirement, passing a Candidacy Examination, presenting an
acceptable Dissertation Proposal, writing a dissertation, and publicly and successfully (no “fail” votes)
defending the dissertation before the Interdisciplinary Doctoral Committee.

Students in the Engineering Applied Mathematics Program must pass a department Qualifying
Examination composed and administered by the participating faculty from the Department of Mathematics
and Computer Science and the participating faculty from on of the five departments in the College of
Engineering.

The Interdisciplinary Doctoral Committee shall consist of at least six members. It shall have an
equal number of faculty members with primary appointments in the College of Engineering and
participating program faculty from the Department of Mathematics and Computer Science. The
participating faculty from the Department of Mathematics and Computer Science must hold joint
appointments in the College of Engineering.

Graduate students who elect the Engineering Applied Mathematics Program may proceed directly
from their baccalaureate degree to the doctoral degree.

Students participating in the Engineering Applied Mathematics Program must have at least 50
percent of minimum course work from the College of Engineering and at least 50 percent of minimum
course work from the Department of Mathematics and Computer Science.
Coordinated Program for the Doctor of Philosophy in Engineering Degree between The University of Akron and Youngstown State University.

The University of Akron and Youngstown State University are engaged in a joint program with the objective of facilitating graduate study by engineering students residing in the proximity of Youngstown State University by providing the opportunity and convenience of completing some of the requirements for the Doctor of Philosophy in Engineering at The University of Akron through joint counseling and enrollment at Youngstown State University.

Admission Requirements

When an engineering graduate student at Youngstown State University declares an interest in the joint doctoral program, the student shall prepare a letter of intent, with academic credentials, to the Dean of Engineering at Youngstown State University. The Dean of Engineering at Youngstown State University shall forward the letter of intent and academic credentials, together with recommendation to the Dean of Engineering at The University of Akron. The Dean of Engineering at The University of Akron shall have the graduate faculty in the applicant’s discipline evaluate the academic credentials and make a recommendation in the academic acceptability of the applicant. If the recommendation is favorable, the student shall be advised to apply to the Graduate School at The University of Akron for formal admission to the Doctoral Program in the College of Engineering at The University of Akron. The Dean of Graduate and Research at Youngstown State University shall be kept informed of the progress of the admission procedure. The applicant from Youngstown State University must satisfy the Admission Requirements for the Doctor of Philosophy in Engineering at The University of Akron.

Degree Requirements

The engineering student from Youngstown State University must satisfy the Degree Requirements for the Doctor of Philosophy in Engineering at The University of Akron, subject to the following modifications:

- One of the members of the Interdisciplinary Doctoral Committee for the joint doctoral program candidate shall be an engineering faculty member from Youngstown State University and normally would be the student’s dissertation director, although this is not necessary. The faculty member from Youngstown State University shall have adjunct status at The University of Akron and qualify for Category II graduate faculty membership.
- One-half (24 credits) of the coursework and one-half (24 credits) of the research credits may be taken at Youngstown State University. The parity of courses is decided by the faculty on the Interdisciplinary Doctoral Committee when the student submits the proposed Plan of Study. At the Advancement to Candidacy, the Committee recommends official transfer of credits from Youngstown State University to The University of Akron.
A Joint Program for the MD and Doctor of Philosophy in Engineering Degree between the College of Engineering at The University of Akron and the Northeastern Ohio Universities College of Medicine.

The College of Engineering and NEOUCOM provide a coordinated program for those desiring both the MD and Doctor of Philosophy in Engineering degrees. This program integrates the knowledge and skills acquired by the student in each of the programs. Each individual coordinated degree program will be tailored to suit the background and research interests of the student. Additional information may be obtained from the Department of Biomedical Engineering at the University of Akron or NEOUCOM.

Admission Requirements

Applicants with a bachelor’s or master’s degree in a discipline other than engineering or in engineering will be required to meet the Admission Requirements for the Doctor of Philosophy Degree in Engineering.

Applicants will be required to have completed the following courses and to have taken the MCAT prior to admission into the coordinated MD and Doctor of Philosophy in Engineering Program.

<table>
<thead>
<tr>
<th>MD</th>
<th>Principles of Chemistry I and II</th>
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<tbody>
<tr>
<td>MD</td>
<td>Organic Chemistry I and II</td>
</tr>
<tr>
<td>MD</td>
<td>Principles of Biology I and II</td>
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<tr>
<td>MD, Ph.D.</td>
<td>Classical Physic I and II</td>
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<tr>
<td>Ph.D.</td>
<td>Statics</td>
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<tr>
<td>Ph.D.</td>
<td>Dynamics</td>
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<tr>
<td>Ph.D.</td>
<td>Strength of Materials (or Materials Science)</td>
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<tr>
<td>Ph.D.</td>
<td>Basic Electrical Engineering (or Circuits I and II)</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Calculus I, II, III, and Differential Equations</td>
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</table>

To obtain an MD degree from NEOUCOM and a Doctor of Philosophy Degree in Engineering from the University of Akron, the student must satisfy NEOUCOM’s degree requirements and the College of Engineering’s Doctor of Philosophy in Engineering Degree Requirements. This coordinated program does not change in any way the degree requirements for either program.

APPENDIX

INTERDISCIPLINARY DOCTORAL FORMS

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<td>Schedule of Dissertation Defense</td>
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<td>IDC-12*</td>
<td>Doctoral Dissertation Defense Report</td>
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</tbody>
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*Memos or forms sent to the Dean of the Graduate School.