

BIOMEDICAL

TEXAS A&M ENGINEERING

Ph.D. Program Handbook



**Department of
Biomedical Engineering**



**TEXAS A&M
UNIVERSITY**



Ph.D. Program Handbook

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(Last updated January 2011)



TEXAS A&M
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Welcome to Biomedical Engineering at Texas A&M

MISSION STATEMENT

The fundamental mission of the Department of Biomedical Engineering at Texas A&M University is to serve our students by providing an exciting and challenging academic environment; to serve our profession through the discovery and dissemination of knowledge; to serve our university system by facilitating and leading multidisciplinary biomedical research; and to serve the growing biotechnology and biomedical device industry in Texas via technology transfer and educating the workforce. *Specifically for the **Ph.D. Program**, the knowledge gained in the classroom and the experience gained through intensive, self-directed research will prepare our students to assume roles of leadership and service in biomedical industry, research, and academia.*

CONTACT INFORMATION

The Department of Biomedical Engineering
337 Zachry Engineering Center
3120 TAMU
College Station, TX 77843-3120

Phone: (979) 845-5532
Fax: (979) 845-4450
Email: bmen@tamu.edu

Website: <http://biomed.tamu.edu>

***This handbook is provided for informational purposes only and does not constitute an official statement of departmental policy. Information in this handbook is subject to change without notice. ***

Steps to Fulfill Ph.D. Degree Requirements

1. Meet with committee chair or faculty graduate advisor to plan course of study for first semester.

When: Before 1st semester registration; Approved by: Committee chair or graduate advisor

2. Establish Advisory Committee; submit your degree plan online.

When: Before the end of the 2nd long semester. Approved by: Advisory Committee, department head, and OGS

3. Complete course work detailed on degree plan and ELP requirements (if applicable).

When: Before Preliminary Exam

4. Pass Preliminary Exam (includes Proposal Defense)

When: Scheduled when no more than 6 hours of formal coursework remain on the degree plan (typically at the end of the 2nd year); If a student enters with a master's degree, the Preliminary Exam must be completed within one calendar year, plus one semester. Written proposal must be sent to committee 2 weeks prior to the Preliminary Exam. Approved by: Advisory Committee

5. Submit Checklist, Report of the Preliminary Exam, and Proposal paperwork to OGS.

When: Must be received by OGS 10 working days after exam date and at least 14 weeks prior to the final defense date; Approved by: Advisory Committee, department head and OGS

6. Complete residence requirement.

When: Before submitting request to schedule final examination; Approved by: OGS

7. Apply for a degree online at <http://howdy.tamu.edu>; pay graduation fee.

When: During the 1st week of the final semester: see [OGS calendar](#) for deadlines; Approved by: OGS

8. Submit Request and Announcement of the Final Exam (defense).

When: Must be received by OGS at least 10 working days before final exam date or by the OGS deadline, whichever comes first. Approved by: Advisory Committee, department head and OGS; Thesis draft must be submitted to Advisory Committee at least 2 weeks before final defense.

9. Upload approved PDF file of the completed dissertation to <http://thesis.tamu.edu> and submit signed Thesis Approval form to the Thesis Office.

When: See [OGS calendar](#) for deadlines; Approved by: Advisory Committee, department head, and OGS

10. Graduation; arrange for cap and gown. For more information, visit <http://graduation.tamu.edu/>.

Summary of Ph.D. Degree Requirements

Degree Plan

Degree plans for Doctoral students should be filed by the end of the 2nd semester AND approved at least 90 days prior to the Proposal Defense/Preliminary Exam. Students will incur a hold and will be blocked from pre-registration if they do not file a degree plan by the deadline. Degree plans are completed through the online submission system at <http://ogsdpss.tamu.edu>. Committee members will need to be decided upon prior to submission of the degree plan. The committee will consist of a committee chair (BMEN), at least two more BMEN faculty committee members, and at least one outside member (not BMEN faculty). Students should discuss their plans with each committee member prior to online submission.

Leveling Courses

Leveling courses are required for students who do not have an engineering background and should be discussed with the student's chair/advisor. Students who have backgrounds in engineering, but disciplines other than biomedical engineering may only be required to take Biomedical Physiology, if a physiology course has not already been taken.

Petitions

After the degree plan has been submitted, any changes to the degree plan, including committee members, coursework, degree program, etc. should be made through a petition to the Office of Graduate Studies. Petition forms can be found at: <http://ogs.tamu.edu/current/petitions.html>.

Residency Requirement

A student who enters the doctoral degree program with a baccalaureate degree must spend one academic year plus one semester in resident study. A student who holds a master's degree when he/she enters the doctoral degree program must spend one academic year in resident study. One academic year may include two adjacent regular semesters or one regular semester and one adjacent 10-week summer semester. The third semester is not required to be adjacent to the one year. Enrollment for each semester must be a minimum of 9 credit hours each to satisfy the residence requirement. (See the Graduate Catalog for more information.)

Preliminary Exam (includes Proposal Defense)

Exam shall be oral and written unless otherwise recommended by the student's advisory committee. The committee chair is responsible for coordinating the written exam with input from the other committee members. Doctoral students should schedule an open proposal defense, which will be followed by a closed session with the committee. The closed session will cover questions on the thesis research and generally related topics. This question/answer period will serve as the oral portion of the Preliminary Exam. The written portion of the Preliminary Exam will be given prior to the Proposal Defense.

Once a student has completed all but 6 hours of formal coursework on their degree plan, the Preliminary Exam should be scheduled (typically at the end of the student's 2nd year after commencing graduate studies within the department.) Students will be notified when they have 6 hours or less of formal coursework remaining. After being notified, the student has 2 semesters to complete the exam (the current semester plus one more). If a student enters with a master's degree, the Preliminary Exam must be completed within one calendar year, plus one semester. Additionally, the exam should not be administered until the proposal is in substantially final form. Failure to meet this requirement could result

in a registration hold. Once the Preliminary Exam is passed, the student has 4 calendar years to complete all remaining requirements.

The Proposal Title Page (signed by all committee members and either the Director of the Graduate Program or the Department Head), the original proposal (approx. 10 pages), and the research proposal timeline* should be submitted to OGS, along with the Preliminary Examination Checklist and the Report of the Preliminary Examination (signed by all committee members). After completing the Preliminary Exam, these documents must be submitted within 10 days to OGS.

**A template for the research proposal timeline is included at the end of this section.*

Guidelines for Proposal Submission

Preparation and Submission

The research proposal is a description of the research which the student intends to undertake and which will be reported in a detailed, comprehensive fashion in the completed thesis.

It offers the student an opportunity to convince the Chair and other members of the Advisory Committee of his/her ability to pursue the projected topic to a successful conclusion. Filing the proposal is one of the requirements for the admission to candidacy for the doctoral degree.

**It is suggested that the Ph.D. proposal follow the format of an NIH proposal.*

Proposal Checklist

- Submit only one original proposal and TITLE PAGE to the Office of Graduate Studies.
- The TITLE PAGE should be signed by the student, all the members of the Advisory Committee, and the head of student's major department or the chair of the student's intercollegiate faculty.
- Appropriate margins and spacing.
- Reasonable length.
- Selected references cited.
- If compliance issues have been approved, please attach appropriate approved form (IRB or IACUC approval).

Applying for Graduation

Students should apply for the Ph.D. degree in the beginning of their last semester. This is done online through the My Record tab in the Howdy portal. The deadline is usually within the first two weeks of the semester.

Final Examination (Dissertation Defense)

The Request and Announcement of the Final Examination (dissertation defense) should be submitted to OGS no less than 14 weeks after the Preliminary Exam paperwork has been submitted AND within 10 days of the scheduled final exam. Questions posed to the student by his/her committee immediately after the dissertation defense may serve as the oral portion of the final exam. A written portion of the final exam may be waived or may be given at the committee's discretion. Students are given one chance to take the final exam.

Prior to scheduling the exam, students must have submitted at least one article to a refereed, archival journal. Proof of the journal submission is required in order to obtain the department head's signature on

the Request and Announcement of the Final Exam. The exam should not be administered until the dissertation is in substantially final form to the student's committee, and all concerned have had adequate time to review and tentatively approve the document (at least 2 weeks in advance).

The Thesis Approval Form and the thesis must be submitted within 10 days of the final examination. The dissertation should be submitted to the Thesis Office according to the guidelines at <http://thesis.tamu.edu>. No content changes may be made to the thesis after this point. The deadline for the thesis/dissertation defense usually falls approximately 8 weeks prior to the graduation date.

Proposal Timeline

(Organized either quarterly or monthly)

Aim 1

- Task 1 _____ May 2009
- Task 2 _____ Aug. 2009
- Task ... _____

Aim 2

- Task 1 _____
- Task 2 _____
- Task ... _____

Aim... _____

Publications _____
Feb. 2010 | Dec. 2010 | May 2011 |

Dissertation Defense (Month) _____ Feb. 2011

Dissertation Submission (Month) _____ March 2011
(no later than 10 days after defense)

Doctoral Degree Plan: From a Bachelor's degree in Engineering

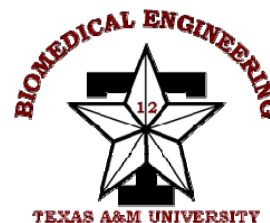
<u>Advisory Committee</u> Advisor/Mentor/Chair BMEN Faculty Member Ph.D.- 4 member minimum <i>Advisor (BMEN)</i> <i>2 BMEN Faculty</i> <i>Faculty outside of BMEN</i>	<u>Degree Requirements</u>	
	<u>Ph.D.</u>	<u>D. En.</u>
	96 hours beyond B.S., 64 hours beyond M.S.	96 hours beyond B.S., 64 hours beyond M.S. or 66 beyond M.En.
	<u>Courses:</u> <ul style="list-style-type: none"> • 12 hrs – BMEN courses *Not including 4/685s • 9 hrs – Electives* *May not include 4/685's *Includes 1 Life Science Elective • 3 hrs – BMEN 674 (Communications) • 4 hrs – BMEN 681 (Seminar) • Research as required (BMEN 691) • Other courses as required *Prereqs/leveling courses 	<u>Courses:</u> In addition to PhD course requirements: <ul style="list-style-type: none"> • 16 hrs internship (BMEN 684) replaces research hours • Specially appointed committee member • Other courses as required *Prereqs/leveling courses
	Preliminary Exam (includes Proposal Defense) Dissertation and defense	Dr. of Engr. Qualifying Exam Final Exam Record of Study (replaces dissertation)

Doctoral Degree Plan: From a Master's degree in Engineering (obtained from a recognized U.S. college or university)

*If the Master's degree is not from the U.S., please refer to the degree plan from a Bachelor's degree.

<u>Advisory Committee</u> Advisor/Mentor/Chair BMEN Faculty Member Ph.D.- 4 member minimum <i>Advisor (BMEN)</i> <i>2 BMEN Faculty</i> <i>Faculty outside of BMEN</i>	<u>Degree Requirements</u>	
	<u>Ph.D. – From Master's in Biomedical Engineering</u>	<u>Ph.D. – From Master's in another Engineering field</u>
	64 hours beyond M.S.	64 hours beyond M.S.
	<u>Courses:</u> <ul style="list-style-type: none"> • 6 hrs – Graduate BMEN courses *Not including 685s *No BMEN hours required if master's was earned in BMEN at TAMU. • 1 Life Science Elective (in addition to physiology leveling course) • 3 hrs – BMEN 674 (Communications) • 2 hrs – BMEN 681 (Seminar) • Research as required (BMEN 691) • Other courses as required *Prereqs/leveling courses 	<u>Courses:</u> <ul style="list-style-type: none"> • 12 hrs – BMEN courses *Not including 685s • 1 Life Science Elective (in addition to physiology leveling course) • 3 hrs – BMEN 674 (Communications) • 4 hrs – BMEN 681 (Seminar) • Research as required (BMEN 691) • Other courses as required *Prereqs/leveling courses
	Preliminary Exam (includes Proposal Defense) Dissertation and defense	Preliminary Exam (includes Proposal Defense) Dissertation and defense

Note: The hour requirements reflected in these degree plans represent the **minimum** departmental requirements. Students may elect to take more courses and/or the student's committee or chair may require more hours than what is listed on these degree plans.



Pre-Approved Life Science Courses

*The following courses may be used to satisfy the Life Science Elective requirement on BMEN Ph.D. degree plans. If you wish to take a course that is not on this list, you must petition Dr. Moore through your committee chair in order to make that request.

BICH 601. Fundamentals of Biochemistry I. (3-0). Credit 3.

Basic biochemical concepts pertaining to the structure of the major biomolecules (proteins, carbohydrates, lipids and nucleic acids); the relationship of structure to function of these molecules; structure and action of enzymes; principles of bioenergetics. Prerequisite: One year of organic chemistry.

BICH 603. General Biochemistry I. (3-0). Credit 3.

The biochemical properties of macromolecules found in living matter; proteins, enzymes and nucleic acids. Prerequisites: BICH 410 or 601; CHEM 228 and 323.

BIOL 413. Cell Biology. (3-0). Credit 3. I, II, S

Structure, function, and biogenesis of cells and their components; interpretation of dynamic processes of cells, including protein trafficking, motility, signaling and proliferation. Prerequisites: BIOL 213 and BICH 410.

BIOL 414. Developmental Biology. (3-0). Credit 3. I

Concepts of development in systems ranging from bacteriophage to the mammalian embryo; use of recombinant DNA technology and embryo engineering to unravel the relationships between growth and differentiation, morphogenesis and commitment, aging and cancer. Prerequisite: BIOL 413 or concurrent enrollment or approval of instructor.

BIOL 613. Cell Biology. (3-0). Credit 3.

Consideration of the eukaryotic cell as a functional, integrated unit in living organisms: structure, composition, function and biogenesis of subcellular components; dynamic processes and interactions of cells, including division, communication, and death; experimental approaches in modern cell biology and selected applications of experimental cell biology to problems in medicine. Prerequisite: BICH 410 or BIOL 213. Concurrent enrollment in BIOL 213 or BICH 410 strongly discouraged.

CHEM 627. Principles of Biological Chemistry. (3-0). Credit 3.

General principles of biological chemistry with an emphasis on the structures and mechanisms of action for proteins, nucleic acids and lipids. Prerequisite: Graduate classification.

MSCI 601. Principles of Basic Medical Sciences I / (5-0). Credit 5. (offered through the Health Science Center)

Molecular basis of cellular functions in human body: technologies for probing cellular functions and structures; plasma membranes and intracellular organelles; gene function; cell metabolism; cell motility and cytoskeleton. Prerequisites: BIOL 413; BICH 303 or equivalent.

SBTM 613 Human Organ Systems I / Credit 5. (offered through the Health Science Center)

This course is the first course of a two-course series designed as an advanced organ systems overview for students interested in a graduate level multidisciplinary study of human organ systems. The overall goal is to teach the student to understand how higher level properties of human biology arise from the complex interactions between the numerous, interactive components of the system. The primary objective is to develop in graduate students the knowledge, appreciation, and integrated understanding of human biology, from a systems perspective. Prerequisite: MSCI 601 is preferred.

SBTM 618. Cardiovascular System. Credit 3. (offered through the Health Science Center)

SBTM 618, Cardiovascular System, is a component of a two-semester series (SBTM 613 and SBTM 614) involving the study of Human Organ Systems. SBTM 618 is an advanced organ systems overview of the Cardiovascular System, and includes two major sections: The Vasculature (Section I), and the Heart and Integrated Cardiovascular Studies (Section II). This course is appropriate for first or second year graduate students within the College of Medicine, as well as graduate students from other colleges and departments (ie: Veterinary Medicine, Bioengineering, Health and Kinesiology) interested in a graduate-level multidisciplinary study of human organ systems.

VIBS 602. Histology. (2-6). Credit 4.

Molecular phenomena placed in context with tissues, organs and organ systems; cell and tissue structures visualized by light microscopy and electron micrographs for functional relationships; clinical correlations reveal relevance of histology in specific disease states; conceptual thinking exercises facilitate problem-solving skills. Prerequisite: Graduate classification.

VTMI 601. Fundamentals of Pathobiology. (5-0). Credit 5.

Encompasses the concepts of pathobiology including bacterial, viral and parasitic diseases, the host response to infectious agents, pathology, and metabolic and genetic diseases; includes animal and human diseases and provides enough background to facilitate students in advanced graduate courses. Prerequisite: Graduate classification.

VTMI 649. Immunology. (3-0). Credit 3.

Cellular basis of the immune response; relationships between inflammation and acquired immunity, MHC and cell activation; the role of cytokines in immunoregulation and hypersensitivity, vaccines, and the mechanism of immunity to viruses, bacteria and parasites. Prerequisite: VTPB 409 or equivalent. Cross-listed with POSC 649.

VTPP 606. Systemic Veterinary Physiology II. (5-0). Credit 5.

In-depth study covering cardiovascular, respiratory, renal physiology, gastrointestinal and endocrine physiology; provides a basic understanding of mammalian physiology essential as a framework for advanced graduate studies. Prerequisite: VTPP 605.

VTPP 653. Endocrinology. (3-3). Credit 4.

Physiology, biochemistry and pharmacology of the endocrines. Laboratory emphasizes a number of classical experiments with clinical application. Prerequisite: Approval of instructor.

VTPP 656. Physiology of the Heart. (4-0). Credit 4.

Structure and function of the heart; molecular and cell biology of cardiac myocytes; electrophysiology of myocardium, pacemaker cells and conducting tissue; cardiac mechanics; control of cardiac performance; coronary circulation. Prerequisite: MPHYS 901 or 604 or approval of department head.

Courses that Will Not Satisfy the Life Science Requirement

**Note: Although these courses cannot be used to satisfy the Life Science Elective requirement, they are still valuable courses which can be taken as regular electives or in addition to the minimum degree plan requirements.*

BIOL 602. Fundamentals of Transmission Electron Microscopy. (3-6). Credit 5.

This course is designed to provide students with state-of-the-art fundamentals in transmission electron microscopy (TEM). Students will be equipped with the necessary theoretical background in support of a strong hands-on course component comprising specimen preparation, image acquisition and interpretation. Students will gain sufficient practical experience to attain a proficiency level permitting independent operation of one of the transmission electron microscopes in the Microscopy and Imaging Center. Prerequisite: Students are required to write a half-page summary describing the specific problem they wish to resolve using transmission electron microscopy.

BIOL 603. Advanced TEM Methodologies in Life and Material Sciences (TEM II). (1-6). Credit 3.
Provides students with advanced TEM methodologies including specimen preparation and TEM imaging/analysis techniques as applicable to both biological and material samples; theory designed to support a strong hands-on component comprising specimen preparation, different imaging/diffraction/spectroscopic techniques and data interpretation. Prerequisites: BIOL 602; graduate classification.

BIOL 604. Fundamentals of Scanning Electron Microscopy (SEM) and Environmental Scanning Electron Microscopy (ESEM). (1-3). Credit 2.
Provides biologists, material scientists, and students from other disciplines with the techniques of operation of the scanning electron microscope (SEM) and the environmental SEM (ESEM) coupled with the appropriate theoretical background knowledge; individual instruction in support of their research endeavors involving SEM/ESEM. Prerequisite: Graduate classification.

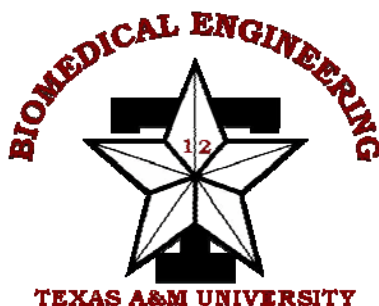
BIOL 608 Theory and Applications of Light Microscopy. (2-3). Credit 3.
This course provides biologists, material scientists and students from other disciplines with the theoretical background and practical techniques of sample preparation, operation of light microscopes as well as image acquisition and processing. In addition, students will receive individual instruction which will facilitate the completion of their research projects involving light microscopic techniques. Prerequisite: half-page write-up describing how their graduate work will benefit.

CHEM 610 Organic Reactions. (3-0). Credit 3.
Organic Reactions. (3-0). Credit 3.
Introduction to mechanisms and scope of the basic organic reaction types as applied to major functional groups. Prerequisite: CHEM 646 or approval of instructor.

VTMI 650. Experimental Immunology. (3-3). Credit 4.
Familiarization, development and integration of techniques into experimental design of immunologic investigation; antibody production, protein purification, immunofluorescence, agar-gel diffusion, immunoelectrophoresis and specialized serologic tests. Cross-listed with POSC 660.

VTPP 657. Cardiovascular Physiology. (3-3). Credit 4.
Physiological considerations of the circulatory system including general and integrative aspects of the heart and blood vessels. Prerequisites: Approval of instructor.

VTPP 677 Fluorescence Detection: Steady State, Time Resolved and Imaging. (3-0). Credit 3.
Fluorescence Detection: Steady State, Time Resolved and Imaging. (3-0). Credit 3.
Fluorescence techniques used by biological scientists in their research, evaluation of the literature in the field, pursuit of resources, interactions with colleagues and resulting from the extension and technological opportunities available through spectroscopy; introduces graduate students in pharmacology, toxicology, biochemistry, molecular biology, and other life sciences to these issues at an early stage in their careers; develops thinking skills to make informed judgments on applicability of fluorescence techniques, evaluating the literature and in presentations, and communicate their rationales to other scientists. Prerequisite: General chemistry and biology course.



LEVELING COURSES for Non-Engineering Majors

If you **did not complete an undergraduate engineering degree**, you must complete the following leveling core courses.*

Course No.	Course Name	Hours
PHYS 218	Mechanics	4
MATH 151	Engineering Math I	4
MATH 152	Engineering Math II	4
MATH 251	Engineering Math III	3
MATH 308	Differential Equations	3
ECEN 214	Electrical Circuit Theory	4
BMEN 240	Biosolid Mechanics	3
BMEN 321/305	Bio. Electronics/Instrumentation	4
BMEN 322/306	Biosignal Anal./Measurement Lab	4
BMEN 341	Biofluid Mechanics	3
BMEN 231	Foundations of Biomechanics	3
BMEN 342	Biomaterials	3
**VTPP 605	Physiology for Bioengineers	5

**To be finalized with selected committee chair.*

*** Physiology is required for anyone who has not taken it, regardless of previous degree. VTPP 605 is recommended but may be substituted by taking both semesters of the undergraduate physiology for bioengineers course VTPP 434/435 or the undergraduate biomedical physiology course VTPP 423.*

Biomedical Engineering Policies & Procedures

Degree Plan/Committee Info

- Committee must be formed no later than the end of student's 2nd semester for all degrees, and committees must be formed before a student can file his/her degree plan.
- Can transfer a maximum of 12 credit hours for M.S. and M.EN. and 24 credit hours for Ph.D. This must be approved by the entire Advisory Committee and the graduate program director before submitting for approval to OGS.
- Up to two upper-level undergraduate courses (300-400) may be used on the degree plan provided that the student's chair and committee approve. Upper-level BMEN courses may **not** be used if the student's undergraduate degree was in BMEN.
- Degree plans must be completed online through the OGS Online Degree Plan System (<https://ogsdpss.tamu.edu/Default.aspx>)
- Students must allow 6-8 weeks for the degree plan to be approved **once it has been submitted to OGS** – so don't wait until the last minute to file, or this could result in a registration hold.
- Students should personally discuss the proposed degree plan with each committee member prior to submitting that degree plan online.
- Needing to travel or obtain visa documents will not be reason enough to remove registration block due to not having a degree plan filed.

Degree Notes

- When needing signatures on forms, check with the Program Coordinator first to get the form initialed before giving to the department head or departmental graduate program director. (OGS, ISS, etc.)
- The Preliminary Exam, which includes the Proposal Defense, must be scheduled when no more than 6 hours of formal coursework remain on the student's degree plan (typically at the end of the student's 2nd year in the department.) Students will be notified when they have 6 hours or less of formal coursework remaining. After being notified, the student has 2 semesters to complete the exam.
- **Minimum of two weeks is required for review of the proposal by the advisory committee and department head prior to the Proposal Defense.**
- No advance notification to OGS is required for the Preliminary Exam.
- It is the **Ph.D. student's responsibility** to download the Preliminary Exam Checklist and the Report of the Preliminary Exam form from the OGS website. The checklist must be signed by the Chair before the Proposal Defense is held.
- Requests to hold Final Exams must be submitted 10 working days prior to exam or by the OGS semester deadline, whichever comes first.
- **Minimum of two weeks is required for review of thesis/dissertation by the department for required signature(s) prior to the Final Defense. Documents submitted with less than two weeks lead time may be refused.**
- Students must attend Seminar every semester in which they are full-time, unless:
 - they have a course in which they are a TA at the same time as the scheduled Seminar, OR
 - they are enrolled in a formal course that meets at the same time as Seminar.

Note: If not attending Seminar, the student's chair will need to write a note to the faculty member who is coordinating the Seminar as to the reason the student is not attending. Students are also required to register for Seminar hours as part of their degree plan requirements. (See degree plan for number of required hours.)

- Continuous Enrollment Rule: All students must be continuously enrolled (excluding summer) after completing all formal coursework. Students holding an assistantship must also be registered full-time in the summer (see next section). Failure to comply with this rule could result in suspension from the university.
- Degree level changes for domestic students must be made no later than the 20th class day in fall/spring and the 4th class day in summer. Degree level changes for international students must be made no later than the 12th class day in fall/spring and the 4th class day in summer. **International students must work with ISS when making this change** to ensure their immigration paperwork is in order.

Registration Comments

- Must take physiology if not taken as an undergraduate. This course is a leveling course that goes “below the line” on the degree plan (not counted in the 64/96 hours).
- Leveling courses: Required of students with non-ENGR, non-BMEN, or Life Sciences undergraduate degrees, with the exact courses required to be determined by the department.
- Leveling or prerequisite courses are not counted towards degree requirements, since they are graduation requirements. However, they do count toward the cumulative GPR.
- Graduate students have three GPRs. One is the cumulative, one is the semester, and the other is the degree plan GPR. All must be maintained at ≥ 3.00 in order to remain in the department.
- ELI courses do not count towards A&M hours, but they do count for ISS/INS purposes.
- All students currently enrolled MUST register during pre-registration periods (ensure sufficient enrollment).
- Exceptions to degree requirements as specified by departmental policy are rarely granted.

English Language Proficiency (for International Students only)

- Students must be **verified** in order to hold prelims/final exams by fulfilling ONE of the following:
 - TOEFL paper score of 550
 - TOEFL computer score of 213
 - TOEFL internet score of 80
 - GRE verbal score of 400
- Students wishing to be employed as TAs must be **certified** by fulfilling ONE of the following:
 - Score of 80 on each of the 4 parts of the ELPE
 - Receive an A or B in a 300-level or higher English Language Institute (ELI) course.
 - Receive alternate certification (with departmental approval and if the undergraduate degree was completed a 4-year U.S. institution)
- The ELPE is offered several times a year. Contact M.A.R.S. at 845-0532 for test information.

Funding Protocol

Please do not solicit graduate research assistant jobs around the campus by asking faculty members from different departments if they have available funding. The appropriate protocol is to be referred by a BMEN faculty member, or to apply for an advertised position.

If looking for a Graduate Assistantship- Non Teaching (GANT), please go to the Pavilion and visit the Student Employment Office. That office has listings for both GANTs and Student Worker positions currently available on campus. You may post your resume with them. You could also browse their

website at <http://jobsforaggies.tamu.edu>. You may also provide your resume to the secretary of the department in which you wish to be considered.

Probation and Dismissal

A Grade Point Ratio (GPR) of greater than or equal to 3.0 must be maintained. A student will be placed on probation for the following long term and blocked from pre-registration if the GPR falls below 3.0. This includes the cumulative, degree plan or semester GPR. One long semester (does not include summer) is allowed to correct the GPR deficiency and return to 3.0 or better. Students with cumulative/degree plan GPRs of less than 3.00 will not be allowed to hold or receive ANY type of departmental financial support. (A student may not participate in an internship if cumulative/degree plan GPR is less than 3.00. If a student's cumulative/degree plan GPR deficiency is not corrected after one long semester, removal from the graduate studies program will be initiated.

Letter Requests

Letters for various purposes are often requested. To obtain a departmental letter, please follow these steps:

- Request letter from chair or temporary chair.
- If approval is granted ask chair if s/he needs help from Program Coordinator in writing the letter.
- If yes, bring all pertinent information (including when the letter needs to be ready) to the Program Coordinator— Do not wait. Upon completion, letter will be placed in your mailbox for chair's signature.

Assistantships/Funding

Assistantships (Research Assistant/Teaching Assistant)

- RA/TA positions are generally half-time employment positions requiring 20 hours per week of work (or to be determined by employer).
- RA/TA positions require full-time student status:
 - Registered for 9 semester hours during Fall/Spring
 - Registered for 6 semester hours during the Summer
- Fellowships come with certain conditions that are unique. *Fellowships differ in length of duration, stipend rates, dispersion, funding for tuition and/or fees, registration requirements, etc. Fellowship recipients should carefully familiarize themselves with the requirements of their individual fellowships.*
- RAs should check with the funding source on number of hours for which to register. It is possible that no service will be required to maintain financial aid, BUT always check with granting agency.
- ELI registration does not count the same as A&M hours (these are extra hours). This means in order to hold assistantships, students must be enrolled as full-time students, and Full-Time= 9 A&M hours + ELI hours.
- Satisfactory academic performance is required (≥ 3.0 GPR in degree plan and cumulative GPRs).
- Students in non-degree status or probationary status are NOT eligible for funding.
- Students are not permitted to change to the Master of Engineering program from the Master of Science or Ph.D. program if they have received departmental support (RA, TA, Scholarships).

Out-of-State Tuition Waivers

- See the departmental Business Coordinator if you receive a TA or RA position which entitles you to in-state tuition to ensure that required forms are completed.

Late Fees

Tuition and fees must be paid before the first day of classes. A \$100 late fee is assessed, and your courses are canceled if tuition and fees are not paid. If you register on the 12th day of class or after, you will be assessed a \$200 late fee.

Other Financial Aid

If you need an emergency tuition loan, you must process this at least a week before classes. Please visit <http://sbs.tamu.edu> for more information.

Miscellaneous Information

Computer Access: The Biomedical Engineering Computer lab is located at the East end of the second floor of Zachry (Room 228). When using the lab after hours, you will need to scan your ID to enter the room. You will need a Biomedical Engineering account to access any engineering computers. To get an account, please see the Computer Systems Manager in Zachry 337F.

Email Address: All students will get a university email address, which they are expected to monitor for important correspondence from the department. For requesting an account or to log in, go to <http://gateway.tamu.edu>. Your NetID will be your username.

Health Insurance: Health Insurance will be included as a benefit for students who have departmental assistantships; however, that coverage will not begin until 90 days after employment. Students should check with their personal insurance provider for specific coverage policies. Some insurance companies will allow students to remain on their parents' policies if they are full-time and under age 25. Other optional health insurance is available through Texas A&M University.

Mailboxes: Each graduate student will have a mailbox that is located at the east end of the Zachry Biomedical Engineering Suite (Rooms 334-337). Keypad code is available upon request.

Parking: Parking permits are required to park on the TAMU campus. The parking lots closest to the Zachry Engineering Center and Wisenbaker are Lots 50 (students) and 51 (faculty/staff). Parking permits can be purchased by logging in with your NetID and password at <http://transport.tamu.edu>.

Shuttle Service: The TAMU Department of Biomedical Engineering does collaborate with other department on campus, some of which are located at the Vet School or the Medical School. Campus shuttles are available for students to get to these locations. There are also off-campus shuttle routes that run to various apartment complexes and stores around the Bryan/College Station area. Shuttle route maps may be found at: <http://transport.tamu.edu/transit.aspx>.

Sports Pass: TAMU has numerous varsity sports teams. Students can purchase a sports pass to attend these events without having to purchase individual tickets. Sports pass information can be found at: <http://mysportspass.tamu.edu>.

Student ID Cards: All students will need a student ID card before the start of classes. The ID office is located on the second floor of the General Services Complex. If you lose your card, replacements are available for a fee.

Tuition and Fees: Information can be found at <http://sbs.tamu.edu>.

Department of Biomedical Engineering Administration

Ms. Ashley Banta	Business Coordinator I (Purchasing/travel)	845-6452	abanta@bme.tamu.edu
Dr. Gerard L. Coté	Department Head	845-4196	gcote@tamu.edu
Mr. Andy Deuel	Facilities Coordinator	845-3537	adeuel@bme.tamu.edu
Dr. Fidel G. Fernandez	Senior Academic Advisor	845-3539	fidel@tamu.edu

Mr. Barry Jackson	Business Administrator (Employment/Funding)	845-5427	b-jackson@tamu.edu
Mr. Ken McCadden	Network Administrator	845-3537	kmccadden@bme.tamu.edu
Dr. James E. Moore	Director of Graduate Programs	845-3299	jmoorej@tamu.edu
Ms. Nicole Priolo	Program Coordinator	845-2312	npriolo@bme.tamu.edu
Ms. Barbara Slusher	Business Associate I	845-2737	bslusher@bme.tamu.edu
Ms. Robin Williamson	Administrative Coordinator	845-2706	rwilliamson@bme.tamu.edu

Student Organizations

Biomedical Engineering Society

The society meets once a month and provides a number of quality programs that are of interest to the biomedical engineering student communities of undergraduate and graduate students. Dinner is provided at all general meetings. Come be a part of this organization. More information can be found at <http://bmes.tamu.edu/>.

Alpha Eta Mu Beta

The national honor society of biomedical engineers has an active chapter here. The chapter inducts both undergraduate and graduate students. The chapter is new and is getting started. This is another way to be involved in departmental student activities.

Graduate Student Council (GSC)

The Graduate Student Council (GSC) serves as the student government for Texas A&M University's graduate and professional students. It is a council of graduate students representing all TAMU graduate students with a purpose to improve graduate students' academic, living and social experiences. The GSC represents student's concerns and is their liaison with the University Administration. General Assembly Meetings take place every 1st and 3rd Tuesday at 5:15 p.m. in Koldus 144. Assembly meetings are open to all graduate students. More info can be found at <http://gsc.tamu.edu/>.

Student Engineering Council (SEC)





The Student Engineers' Council (SEC) is the representative body for all students in the Dwight Look College of Engineering at Texas A&M University. Formed by the Dean of Engineering in 1939, the SEC represents the concerns of engineering students and professional societies to the college administration and to the university as a whole. Meetings are held every Monday evening. See <http://sec.tamu.edu/about/> for more information.




Engineers Without Borders





EWB-TAMU delivers sustainable and innovative solutions to real-world problems in order to empower international communities by offering opportunities for the students of Texas A&M University to: manage international engineering projects; develop relationships with members of other cultures; create engineering designs; lead the implementation of those designs, and initiate the supporting functions of the projects: fundraising, manage finances and establish relationships with faculty and donors. More info can be found at <http://ewb.tamu.edu/>.





**A comprehensive, searchable list of all Texas A&M student organizations can be found at <http://studentactivities.tamu.edu/online/search/index>.*

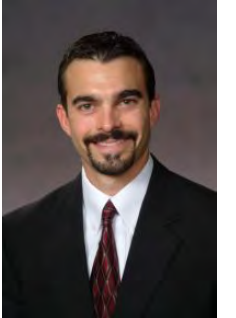






Faculty Member	Areas of Interest	Contact Information
 Brian E Applegate Assistant Professor	Molecular imaging Optical imaging Optical diagnostics Biomedical optics Tissue spectroscopy	Phone: 979-862-6521 Email: apple@tamu.edu
 Fred Clubb Clinical Professor	Electron microscopic evaluation of myocardial and renal biopsies Qualitative and quantitative evaluation of implantable cardiovascular devices for nonGLP and GLP\preclinical trials	Phone: 979-229-9862 Email: fclubb@cvm.tamu.edu
 Elizabeth Cosgriff-Hernandez Assistant Professor	Biomaterials Tissue Engineering Cell-Material Interactions Biodegradation Mechanisms Hierarchical Structure- Property Relationships	Phone: 979-845-1771 Email: cosgriff.hernandez@bme.tamu.edu
 Gerard L Cote Charles H. & Bettye Barclay Professor and Department Head	Optical Sensing & Spectroscopy Optical Diagnostics Biomedical Imaging Development of noninvasive sensors	Phone: 979-845-5494 Email: gcote@tamu.edu

 <p>John C Criscione Associate Professor and Director of Undergraduate Programs</p>	<p>Nonlinear solid mechanics Cardiac mechanics Constitutive modeling Computational mechanics Cellular mechanics Applications of soft tissue biomechanics in industry and medicine</p>	<p>Phone: 979-845-5428 Email: jccriscione@tamu.edu</p>
 <p>Ana Egatz-Gomez Research Assistant Professor</p>	<p>Lab-on-a-Chip Clinical Diagnostic Applications Microfluidic Systems Nanotechnology Drop-based microfluidic devices</p>	<p>Phone: 979-845-5540 Email: angomez@bme.tamu.edu</p>
 <p>Melissa A Grunlan Associate Professor</p>	<p>Anti-fouling surfaces Polymer colloids Polymeric hydrogels Biologically inspired materials Modification of polymeric surfaces</p>	<p>Phone: 979-845-2406 Email: mgrunlan@tamu.edu</p>
 <p>Mariah Hahn Associate Professor</p>	<p>Vascular tissue engineering Cell-biomaterial Interactions Mesenchymal stem cell differentiation</p>	<p>Phone: 979-862-1454 Email: mariah.hahn@che.tamu.edu</p>
 <p>Arum Han Associate Professor</p>	<p>Lab-on-a-Chip (UTAS), BioMEMS Micro-Bio-Nanotechnology for Medical/Bio Applications Micro and Nano Fluidic Systems Bio-Nano Interfacing and Packaging Miniaturized Magnetic Resonance Imaging (MRI) Systems</p>	<p>Phone: 979-845-9686 Email: arum.han@ece.tamu.edu</p>

 <p>Tom Hedman Research Associate Professor</p>	<p>Orthopaedic Biomechanics Spinal biomechanics Nonsurgical modification of extracellular matrix Applications of chemical collagen crosslinking in medicine</p>	<p>Phone: 512-864-1589 Email: tphedman@tamu.edu</p>
 <p>Wonmuk Hwang Assistant Professor</p>	<p>Amyloid Fibrillogenesis Cell Motility Computer Simulation of Biomolecules Cytoskeleton/Membrane Dynamics Fabrication of Biomaterials through Macromolecular Self-Assembly Mechanotransduction Molecular Motors Multiscale Modeling Self-assembly and mechanobiology of collagenous tissues</p>	<p>Phone: 979-458-0178 Email: hwm@tamu.edu</p>
 <p>Harry Hogan Associate Professor</p>	<p>Solid mechanics, stress analysis, mechanics of materials, failure analysis Finite element methods; theory and modeling strategies Design and the design process International experiences and awareness</p>	<p>Phone: 979-845-1538 Email: hhogan@tamu.edu</p>
 <p>William A. Hyman Professor Emeritus</p>	<p>System safety and human factors Medical device design and regulation Clinical engineering</p>	<p>Email: w-hyman@tamu.edu</p>

 <p>Arul Jayaraman Associate Professor</p>	<p>Systems Biology Inter-kingdom signaling and Host-pathogen interactions Microfluidics and BioMEMS</p>	<p>Phone: 979-845-3306 Email: arulj@tamu.edu</p>
 <p>Javier Jo Assistant Professor</p>	<p>Biomedical signal/image processing and time-series analysis Mathematical modeling Mathematical pattern recognition Optical diagnostics and biosensing Atherosclerosis</p>	<p>Phone: 979-458-3335 Email: javierjo@bme.tamu.edu</p>
 <p>Roland R Kaunas Assistant Professor</p>	<p>Cell Mechanics Cell Motility Cell Signaling Cytoskeleton/Focal Adhesion Dynamics Mechanotransduction Stem Cell Biology Tissue Engineering Vascular Biology Microcirculation</p>	<p>Phone: 979-845-2412 Email: rkaunas@bme.tamu.edu</p>
 <p>John Lawler Professor</p>	<p>Exercise protection of the heart against oxidative stress and cell loss Exercise training and antioxidant capacity Nitric oxide, free radicals and skeletal muscle function Oxidative stress and cardiovascular disease Oxidative stress and muscle wasting</p>	<p>Phone: 979-845-2412 Email: jml2621@tamu.edu</p>

	<p>Interventional devices Stroke Therapeutic optics Microactuators Shape memory polymers Computational physics</p>	<p>Phone: 979-458-3471 Email: djmaitland@tamu.edu</p>
<p>Duncan J. Maitland Associate Professor and Director of Graduate Programs</p>	<p>Confocal Microscopy Optical Imaging and Spectroscopy Optical Diagnostics Endoscope Design Image Processing In Vivo Imaging Cancer Detection</p>	<p>Phone: 979-845-1864 Email: kmaitland@tamu.edu</p>
	<p>Medical Imaging, specifically high-speed Magnetic Resonance Imaging</p>	<p>Phone: 979-845-2421 Email: mpmcdougall@tamu.edu</p>
<p>Kristen Maitland Assistant Professor</p>	<p>Biosensors and Analytical Devices Micro/Nanotechnology Biomaterials Biomedical Optics</p>	<p>Phone: 979-845-7941 Email: mcsbane@bme.tamu.edu</p>
		
<p>Mary P McDougall Assistant Professor</p>		
		
<p>Mike McShane Associate Professor</p>		






	<p>Biomaterials Biophotonics (optics) Imaging Nano/ micro</p>	<p>Phone: 979-458-0180 Email: kmeissner@tamu.edu</p>
	<p>Cardiovascular Mechanics Hemodynamics Arterial Blood Flow Patterns Arterial Wall Solid Mechanics Atherosclerosis Aneurysms Interventional Radiology Interventional Cardiology Minimally Invasive Disease Treatment Stents Stent Grafts Endografts Platelets Smooth Muscle Cells Inflammation Restenosis</p>	<p>Phone: 979-845-3299 Email: jmoorej@tamu.edu</p>
	<p>Mechanical Environments of Living Systems Fluid Mechanics Cardiovascular Mechanics Cell & Tissue Mechanics Orthopedic Biomechanics Mechanotransduction Biomimetics Mechanical Factors in Disease Development and Treatment Medical Devices & Therapies GLP/GMP/QSR</p>	<p>Phone: 979-845-8500 Email: Michael.moreno@tamu.edu</p>
	<p>microfabricated biosensors, neovascularization of implanted biomaterials and "smart" drug delivery systems</p>	<p>Phone: 979-845-3348 Email: mpishko@tamu.edu</p>

Kenith Meissner
Assistant Professor

James E Moore
Professor

Michael R. Moreno
TEES Assistant Research Professor

Michael Pishko
Stewart and Stevenson Professor II

	<p>Coordination of adaptation in vascular networks Arterial pulse wave transmission and reflection Arteriovenous malformations Arterial pulse wave analysis Lymphangion interaction Cerebral blood flow Carotid stenting</p>	<p>Phone: 979-845-2645 Email: cquick@cvm.tamu.edu</p>
	<p>Theoretical Modeling Non-linear Mechanics Non-Newtonian Fluid Mechanics Turbulence Deformations of Solids Viscoelasticity Biomaterials Shape Memory Alloys</p>	<p>Phone: 979-862-4552 Email: krajagopal@tamu.edu</p>
	<p>Biotribology Orthopaedic implants Skin tribology and haptics Polymeric biomaterials Implant design</p>	<p>Phone: 979-845-9591 Email: cschwartz@tamu.edu</p>
	<p>Mechanotransduction Cell mechanics Cytoskeleton/Focal Adhesion dynamics Extracellular matrix Optical imaging Cell manipulation (AFM) Microcirculation Vascular biology</p>	<p>Phone: 979-845-7990 Email: trache@tamu.edu</p>
	<p>Transport and flow in microfluidic systems, microdevices for DNA analysis, convectively driven biochemical reactions, and materials and processes for fabrication of microfluidic devices.</p>	<p>Phone: 979-458-1002 Email: ugaz@tamu.edu</p>




Christopher Quick
Associate Professor

K.R. Rajagopal
Forsyth Chair Professor

Cris Schwartz
Assistant Professor

Andreea Trache
Assistant Professor

Victor Ugaz
Associate Professor

	Instrumentation and methodology for magnetic resonance imaging	Phone: 979-845-9413 Email: smwright@tamu.edu
Steven Wright R.E. Wisenbaker II Professor	Laser; Ultrafast, Spectroscopy, Raman, Nonlinear Optics, Microfluidics, Microscopy, Imaging, Biology, Medicine.	Phone: 979-458-2326 Email: yakovlev@tamu.edu
	Biomedical Optics Nonlinear Optical Microscopy Tissue Optics Tissue Engineering Mechanobiology Extracellular Matrix Matrix Remodeling Wound Healing Cornea	Phone: 979-845-5468 Email: ayeh@tamu.edu
Vladislav Yakovlev Professor		Alvin T Yeh Associate Professor

ASSOCIATE FACULTY:

Theresa Fossum Associate Professor, College of Veterinary Medicine	tfossum@tamu.edu
Donald Hulse Professor, College of Veterinary Medicine	dhulse@tamu.edu
Georghe Stoica Professor, College of Veterinary Medicine	g-stoica@tamu.edu

ADJUNCT FACULTY:

Christopher Bertram Associate Professor, The University of New South Wales	c.bertram@unsw.edu.au
Gerald Meininger Director, Dalton Cardiovascular Research Center	Dalton@missouri.edu
J. Stuart Nelson Professor of Surgery, Dermatology and Biomedical Engineering	jsnelson@uci.edu
Emily Wilson Assistant Professor, Department of Medical Physiology	emilyw@tamu.edu



Graduate Courses *(Some courses are not offered every semester.)*

603 Information Processing in Biomedical Engineering

(3-3) Credit 4. Methods for evaluating alternative approaches in signal processing systems for biomedical applications; provides familiarity with the variety of existing software and hardware systems. Prerequisite: Approval of instructor.

604 FDA Good Laboratory and Clinical Practices

(3-0) Credit 3. Implementation of Good Laboratory Practices (GLP) for the submission of preclinical studies and use of Good Clinical Practices (GCP) in clinical trials in accordance with Food and Drug Administration (FDA) regulations; includes similarities and differences in GLP and GCP critical for the introduction of new drugs and medical devices. Prerequisites: BMEN 430 or 630 and Graduate classification, or approval of instructor.

605 Virtual Instrumentation Design for Medical Systems

(2-3) Credit 3. Design of medical systems using graphics programming language of LabVIEW including the designing and programming of three virtual systems: cardiac monitor, electromyogram system for biomechanics, and sleep stage analyses for electroencephalograms. Prerequisite: approval of instructor.

607 Clinical Engineering

(3-0) Credit 3. Responsibilities, functions and duties of the hospital based biomedical engineer, including program organization, management, medical equipment acquisition and use, preventive maintenance and repair and hospital safety. Prerequisite: Approval of instructor.

608 Optical Diagnostic and Monitoring Principles

(3-0) Credit 3. Principles of optical spectroscopy, including absorption, fluorescence, and scattering spectroscopy; emphasis on understanding how light interacts with biological samples and how these interactions can be optically measured, quantified, and used for medical diagnosis and sensing. Prerequisites: MATH 308; PHYS 208.

609 Optical Therapeutic and Interventional Principles

(3-0) Credit 3. Study of mechanical and thermal processes of radiation interaction with biological tissue; issues and objectives in therapeutic, surgical, and diagnostic applications; basic engineering principles used in developing therapeutic with a focus on the use of lasers and optical technology. Prerequisite: MATH 308; PHYS 208.

611 Biomedical Imaging Systems

(3-0) Credit 3. The physics behind the major medical imaging systems including CT, MRT, Ultrasound, and X-ray will be introduced and described; a linear systems approach will be used along with basic diffraction theory. Prerequisites: BMEN 322; MATH 308.

620 Bio-Optical Imaging

(3-0) Credit 3. Optical imaging techniques for detection of structures and functions of biological tissues; basic physics and engineering of each imaging technique. Prerequisites: MATH 308.

621 Microscale Bio-Optical Applications

(3-0) Credit 3. Introduction to the biomedical application of lasers to manipulation, detection, and visualization on (sub)cellular length scales, with emphasis on governing principles on which applications are founded; applications from recent literature (state-of-the-art) presented. Prerequisites: approval of instructor

624 Biomedical Sensing and Imaging at the Nanoscale

(3-0) Credit 3. This course serves as an introduction to nanotechnology with an emphasis on biomedical techniques and medical applications. The material covered ranges from the basic physics of contrast agents to the engineering of current sensing and imaging systems applied at the nanoscale. Prerequisites: PHYS 208, MATH 308.

626 Optical Biosensors

(3-0). Credit 3. Introduction to biosensing principles and detailed analysis of optical methods for transduction; fluorescence-based transduction; molecular recognition of targets; immobilization of sensing reagents; quantitative analysis of sensing systems; design and characterization of sensing assays and associated measurement systems; review of historical and current trends in optical biosensors. Prerequisites: Approval of instructor.

630 Global Medical Device Regulation

(3-0) Credit 3. Overview of applicable U.S. and international regulations and regulatory processes for the design, approval and marketing of medical devices. Prerequisites: Approval of instructor.

631 Thermodynamics of Biomolecular Systems

(3-0) Credit 3. Introduces equilibrium and non-equilibrium statistical mechanics and applies them to understand various biomolecular systems; including ensemble theory, reaction kinetics, nonlinear dynamics, and stochastic processes; with applied examples such as enzyme-ligand binding kinetics, conformational dynamic of proteins and nucleic acids, population dynamics, and noise in biological signals. Prerequisites: BMEN 240, PHYS 208, and MATH 308.

632 Molecular and Cellular Biomechanics

(3-0) Credit 3. Introduces Biomolecules and their assemblies that play structural and dynamical roles in subcellular to cellular level mechanics, with emphasis on quantitative/theoretical descriptions, and discussions of the relevant experimental approaches to probe these nano to micro-scale phenomena; including topics in (1) self-assembly of cytoskeleton and biomembranes, (2) molecular motors, (3) cell motility, and mechanotransduction. Prerequisites: BMEN 240 and MATH 308.

635 Biomaterials Compatibility

(3-0). Credit 3. Relevance of mechanical and physical properties to implant selection and design; effect of the body environment on metallic, ceramic, and plastic materials; tissue engineering; rejection mechanisms used by the body to maintain homeostasis regulatory requirements. Prerequisite: Approval of instructor.

640 Design of Medical Devices

(3-0) Credit 3. Overview of the multiple issues in managing the design of a marketable medical device, including the design process from clinical problem definition through prototype and clinical testing to market readiness; includes FDA pre-and post-market regulation, human factors and system safety considerations, and medical product liability. Prerequisite: approval of instructor.

650 Biomedical Optics Laboratory

(2-3) Credit 3. Biomedical optics technology; basic engineering principles used in developing therapeutic and diagnostic devices; a series of hands-on labs will be performed including optical monitoring, diagnostic and therapeutic experiments. Prerequisites: MATH 308; PHYS 208.

652 Cell Mechanobiology

(3-0). Credit 3. The course will focus on how mechanical forces influence cell behavior through physical and biochemical mechanisms. The objectives include integrating engineering and cell biology to solve biomedical problems, which includes developing models for applying forces to cultured cells and tissues and measuring changes in cell biochemistry, structure and function. Prerequisite: BMEN 282.

660 Vascular Mechanics

(3-0) Credit 3. Application of continuum mechanics to the study of heart arteries; on the measurement and quantification of material properties, and the calculation of vascular stresses; analysis of several cardiovascular devices to reinforce the need for careful analysis in the device design. Prerequisite: BMEN 240 and 341 or equivalents.

661 Cardiac Mechanics

(3-0) Credit 3. Application of continuum mechanics and computational solid mechanics to the study of the mammalian heart; utilization of continuum mechanics and finite element analysis in solving

nonlinear boundary value problems in biomechanics.
Prerequisite: BMEN 240 and 602; MEMA 467; or equivalents.

662 Vascular Fluid Mechanics

(3-0) Credit 3. Bio-fluid mechanics of the human circulatory system including examination of disease development and medical treatments. Prerequisites: BMEN 240 or equivalent.

663 Soft Tissue Mechanics and Finite Element Methods

(3-0) Credit 3. Application of continuum mechanics and finite element methods to the study of the mechanical behavior of soft tissues and associative applications in biomedicine.
Prerequisites: BMEN 240 or equivalent.

668 Biothermomechanics

(3-0) Credit 3. Application on continuum thermomechanics to quantify soft tissue behavior in response to combined thermal and mechanical loads including thermoelasticity and thermal damage.
Prerequisites: BMEN 240, 341.

669 Entrepreneurial Issues in Biomedical Engineering

(3-0) Credit 3. Description and analysis of issues associated with initiating business ventures to transfer biomedical technologies into the health care sector, including intellectual property protection, seed funding alternatives, and business strategies relevant to the biomedical engineering technology area; and utilizing recent case studies of previous ventures. Prerequisites: Approval of instructor.

674 Communications in Biomedical Engineering

(3-0) Credit 3. General concepts for communicating the results of biomedical research including written papers, conference proceedings, proposals and grants, as well as oral presentations and basic ethics.
Prerequisite: Approval of instructor.

675 Biomedical Case Studies

(1-0) Credit 1. Introduction to the engineering design process for solving biomedical problems by using the case study method in biomedical instrument design.
Prerequisite: Approval of instructor.

680 Biomedical Engineering of Tissues

(3-0) Credit 3. Introduction to engineering strategies used to repair tissue; literature-grounded overview of current strategies using stem cells, 3D scaffolds and drug/gene delivery including ethical considerations of these therapies. Prerequisites: BMEN 343 or approval of instructor.

681 Seminar

(1-0) Credit 1. Designed to permit student to broaden capability, performance and perspective in biomedical engineering via his or her own formal presentation and by presentations by other professionals. Prerequisite: Approval of Instructor.

682 Polymeric Biomaterials

(3-0). Credit 3. Preparation, properties, and biomedical applications of polymers including: polymerization; structure-property relationships; molecular weight and measurement; morphology; thermal transitions; network formation; mechanical behavior; polymeric surface modification; polymer biocompatibility and bioadhesion; polymers in medicine, dentistry, and surgery; polymers for drug delivery; polymeric hydrogels; and biodegradable polymers.
Prerequisites: BMEN 342, or instructor approval.

683 Polymeric Biomaterial Synthesis

(3-0). Credit 3. Overview of polymer synthetic routes and key structure-property relationships with emphasis on the design of polymeric systems to achieve specific properties; tissue engineering and drug delivery applications will be used as model systems to explore the process of biomaterial design from synthesis to device evaluation. Prerequisites: BMEN 343 or instructor approval.

684 Professional Internship

Credit 1 or more each semester. Training under the supervision of practicing engineers in settings appropriate to the student's professional objectives.

Prerequisites: Approval of chair of student's advisory committee and department head.

685 Directed Studies

Credit 1 to 12 each semester. Allows students the opportunity to undertake and complete, for credit, limited investigations not included within thesis or dissertation research and not covered by other courses. May be repeated for credit.

Prerequisites: Approval of designated instructor and approved project proposal.

686 Biomedical Nanotechnology

(3-0). Credit 3. Introduction to nanotechnology applications in biomedicine; concepts of scale; unique properties at the Nanoscale; biological interaction, transport, and biocompatibility of nanomaterials; current research and development of nanotechnology for medical applications, including sensors, diagnostic tools, drug delivery systems, therapeutic devices, and interactions of cells and biomolecules with nanostructured surfaces. Prerequisites: BMEN 343, approval of instructor.

689 Special Topics in . . .

Credit 1 to 4. Selected topics in an identified area of biomedical engineering. May be repeated for credit.

Prerequisite: Approval of instructor.

689 Biophotonics

(3-0). Credit 3. Overview of optical instrumentation, including light sources, lasers, detectors, and optical fibers; instrumentation and engineering in biomedical applications of optics in therapeutics, diagnostics, and biosensing. Prerequisites: Approval of instructor.

689 Computational Biomechanics

(3-0). Credit 3. Examination of complex geometries or inherent material nonlinearities and numerical methods needed to solve nonlinear ordinary differential equations found in soft tissue elastodynamics and the biochemomechanics of growth and remodeling and those needed to solve (elliptic) partial differential equations in nonlinear stress analyses of soft tissues.

Prerequisites: Approval of instructor.

689 Modern Biomedical Nonlinear Optical Microscopy

(3-0). Credit 3. Survey of modern applications of nonlinear optical microscopy to biomedical and life sciences research. A working knowledge of laser scanning microscopy is assumed, and more intimate understanding of nonlinear optical microscopy will be expected through the study of current literature (and relevant background references). Prerequisites: Approval of instructor.

691 Research

Credit 1 or more each semester. Research for thesis or dissertation.

SPRING SEMESTER 2011*NOTE: Failure to meet deadlines may result in the postponement of receipt of the degree.****These dates are subject to change.****REGISTRATION AND DROP/ADD**

January 3	Monday	Last day to submit approval form and PDF of thesis in final form by 5:00 p.m. to avoid registration in spring semester.
January 14	Friday	Last day to register for spring semester classes and pay fees by 5:00 p.m..
January 18	Tuesday	First day of spring semester classes.
January 24	Monday	Last day to clear Thesis Office by 5:00 p.m. to avoid registration in spring semester.
January 24	Monday	Last day for adding/dropping courses for the spring semester by 5:00 p.m.
January 28	Friday	LAST DAY TO APPLY FOR ALL DEGREES TO BE AWARDED IN MAY BY 5:00 P.M.
April 4	Monday	Last day for <u>all</u> students to drop courses with no penalty (Q-drop)
April 4	Monday	Last day to officially withdraw from the University.

APPLICATIONS FOR DEGREE (DIPLOMA ORDER)

January 5	Wednesday	First day to apply for degrees to be awarded in May.
January 28	Friday	LAST DAY TO APPLY FOR DEGREES TO BE AWARDED IN MAY. A diploma fee of \$40.00 must be paid either at registration or at the Fiscal Office (GSC). Complete the application for degree form via the Howdy Portal. A LATE CHARGE OF \$50.00 WILL BE ASSESSED TO STUDENTS WHO APPLY FOR GRADUATION AFTER 01-28-11.

CLEARANCE

May 12	Thursday	Academic Degree Audits conducted <i>after</i> 5:00 p.m.
May 13	Friday	Academic Degree Audit results available.

COMMENCEMENT

May 13	Friday	Commencement
May 14	Saturday	Commencement

Degree plans must be approved by our office at least **90 working days** prior to submission of the Request and Announcement of the Final Examination.

MASTER'S – NON-THESIS OPTION

November 12	Friday	Last day to file degree plan with the Office of Graduate Studies.
March 7	Monday	Midsemester – first day to take final orals for students enrolled in courses on degree plan.
April 1	Friday	Last day to submit "Request and Announcement of the Final Examination" or 10 working days prior to the examination, whichever comes first to the Office of Graduate Studies.
April 1	Friday	Last day to submit "Request for Exemption from Final Examination" for students in M.Eng., MCS or M.Ed. in EPSY.
April 15	Friday	Last day to take final examination.

MASTER'S – THESIS OPTION

October 4	Monday	Last day to file degree plan with the Office of Graduate Studies.
February 25	Friday	Last day to submit "Request and Announcement of the Final Examination" or 10 working days prior to the examination, whichever comes first to the Office of Graduate Studies.
February 25	Friday	Last day to submit "Request for Exemption from Final Examination"
March 11	Friday	Last day to take final exam (defend thesis)
March 25	Friday	Last day to submit a signed approval form and a PDF file of the thesis in final form by 5:00 p.m. The signed approval form is submitted to the Thesis Office . The PDF file must be submitted via the web to http://thesis.tamu.edu .
April 27	Wednesday	Last day to submit final corrections of thesis to the Thesis Office by 5:00 p.m.

DOCTORAL DEGREES

Preliminary examination results must be received by our office at least **14 WEEKS** prior to the final examination date.

October 4	Monday	Last day to file degree plan with the Office of Graduate Studies.
February 25	Friday	Last day to submit "Request and Announcement of the Final Examination" or 10 working days prior to the examination, whichever comes first to the Office of Graduate Studies.
March 11	Friday	Last day to take final exam. (defend dissertation or record of study)
March 25	Friday	Last day to submit a signed approval form and PDF of the dissertation in final form by 5:00 p.m. Signed approval form is submitted to Thesis Office . The PDF file must be submitted via the web to http://thesis.tamu.edu .
April 27	Wednesday	Last day to submit final corrections of dissertation or record of study to the Thesis Office by 5:00 p.m.

ADDITIONAL DEADLINES FOR DEGREES TO BE CONFERRED IN MAY 2010

April 8	Friday	Last day to submit petitions to change degree plan coursework for students in master's programs without a final examination requirement: MAB, MBA, MMR, MIA, MID, MPSA, MRE, MS programs in the Lowry Mays College of Business, and MS programs in EHRD – HRD option.
June 3	Friday	Last day to CLEAR for spring 2011 graduation. (Applies ONLY to those students not clearing final audit on degree audit night.)

THESIS/DISSERTATION/PROPOSAL DEADLINE IS 15 WORKING DAYS PRIOR TO THE SUBMISSION OF "REQUEST AND ANNOUNCEMENT OF THE FINAL EXAMINATION" TO THE OFFICE OF GRADUATE STUDIES.

Students should check with their graduate advisors concerning deadlines for submitting material to departments.

Related Forms and Documents

The following forms and documents are for example and reference only. In order to download and fill out an OGS form, you will need to visit the OGS website at <http://ogs.tamu.edu/forms/student-forms>. When filling out the form, you must type the information, print the form, and then obtain signatures. Do not fill out the form by hand.

*Any form or document requiring the signature of the graduate advisor (Dr. James E. Moore) or the department head (Dr. Gerard Cotè) must first be initialed by the graduate program coordinator (Ms. Nicole Priolo). If the program coordinator is unavailable, the undergraduate advisor (Dr. Fidel Fernandez) may initial instead.

Office of Graduate Studies

Degree Plans Fact Sheet

Each graduate student must submit an official degree plan to the Office of Graduate Studies (OGS) for approval. The degree plan formally declares your degree objective, the membership of your advisory committee, and the specific courses that you will be required to complete as part of your degree program. You will develop your proposed degree plan in consultation with your advisory committee. The degree plan must be approved by your advisory committee members, your department head and, if applicable, your intercollegiate faculty chairperson.

Completed degree plans must be submitted to OGS according to the following regulation with the student meeting whichever of these deadlines falls earliest:

- *following the deadline imposed by the student's college or interdisciplinary degree program.*
- *no later than 90 days prior to the date of the final oral examination or thesis defense for master's students or 90 days prior to the date of the preliminary examination for doctoral students*
- *according to deadlines published in the OGS calendar each semester for graduation that semester.*

The calendar may be found at: <<http://ogs.tamu.edu/OGS/currentCalendars.htm>>.

Specific rules and limitations on course work and committee membership can be found in the Texas A&M University *Graduate Catalog*. Once a degree plan is approved by OGS, changes in course work or committee membership may be requested by petition to OGS. "Petition Forms" may be downloaded from the OGS homepage. Changes of major, degree or department must be requested by submitting a petition and/or a new degree plan/course work petition.

Degree Plan Checklist

Did you remember to:

- Provide your correct Student Identification Number?*
- Have all required transcripts sent to the Office of Graduate Admissions?*
- Use official course numbers and department abbreviations?*
- Confirm eligibility of transfer work?*
- Confirm that all committee members are members of the Graduate Faculty?*
- Provide correct names and departmental affiliations of committee members?*
- Make sure any special appointments have been approved or that the proper paperwork is sent to OGS along with the degree plan?*
- Observe all requirements and limitations on use of course work, outlined in the Graduate Catalog?*

Office of Graduate Studies

Degree Plans Fact Sheet

Q&A

Q: When should I submit my degree plan?

A: Prior to the deadline imposed by the student's college, or interdisciplinary degree program, if applicable, and no later than 90 days prior to the date of the final exam (Masters), or the preliminary exam (Doctoral), or by the deadline on the OGS calendar.

Q: *May I submit my degree plan after the published deadline?*

A: Students are advised to meet the deadlines that apply to them. Failure to do so may jeopardize approval for the student to graduate at the end of the desired semester.

Q: *How long does it normally take for OGS to process degree plans?*

A: The processing time depends on when the degree plan is submitted. If the degree plan is submitted near the published deadline for the semester, processing can take 6 to 8 weeks. Degree plans submitted at other times during the semester can be processed in 2 to 4 weeks.

Q: *How many hours are needed on my degree plan?*

A: Specific requirements vary by degree. Generally, master's non-thesis-option students must carry 36 hours and master's thesis-option students must carry 32 hours for the MS, and 30 hours for the MA, MCS and MEN. Students should check the Graduate Catalog for their specific hour requirements. Doctoral students must carry 96 hours if they do not have a master's degree, and they must carry 64 hours if they have a master's degree. See the *Graduate Catalog* for additional information.

Q: *How should I list courses on my degree plan: alphabetically or by course number?*

A: As long as your ordering system is uniform,

you may use either system.

Q: *How many committee members do I need?*

A: Advisory committees for master's degrees must have at least three members, and advisory committees for doctoral degrees must have at least four members. Special appointments to your committee are not included in this count. Your chairperson must be from your department or from your intercollegiate faculty (if applicable), and you must have at least one member from outside of your department.

In some departments the student's committee will be comprised of the Graduate Program Director. Your department can tell you which type of committee applies to you.

Q: *What do I need to do if changes are needed AFTER my degree plan has been approved?*

A: Once your degree plan has been approved, any changes must be requested by submitting the appropriate OGS Petition Form. Your signature together with those of your committee, department head and intercollegiate faculty chair (if applicable) are required on the petition.

Q: *If one of my committee members is out of town, can someone else sign the degree plan for him or her?*

A: Yes, any authorized signer for that member's department or intercollegiate program may sign.

Q: *Where can I go for help in completing my degree plan?*

A: Start with your graduate advisor in your department. The *Graduate Catalog* and a copy of your transcript are also useful. You may access the *Graduate Student Handbook* on the Internet: <<http://ogs.tamu.edu/OGS/currentGraduateHandbook.htm>>. If you still have questions, call the OGS staff at (979) 845-3631 or e-mail them at ogs@tamu.edu.

Q: *Why is it important to have deadlines for the submission of degree plans?*

A: The degree plan is to be a "plan" of courses the student and advisory committee have selected to fulfill the degree requirements. The plan should be formulated early in the student's graduate career and not serve as a report of courses taken.

Name: _____

UIN: _____

Ph.D. Degree Plan Worksheet
Department of Biomedical Engineering

Instructions: This worksheet is designed to be completed prior to entering your degree plan online through <https://ogsdpss.tamu.edu>, and the purpose is to help you insure that your degree plan satisfies university and departmental policies. However, you cannot design your degree plan without explicit help from your faculty research advisor (chair), since each faculty member may have requirements beyond these minimal departmental requirements. After completing the worksheet and prior to entering it online, it is suggested that you meet with the Program Coordinator to make sure it meets all degree requirements. This will help expedite the first round of approval of your degree plan.

1. Total # of Hours Required on Degree Plan _____

- Available Options {
- a. Entered program without a master's degree – **96 hrs**
 - b. Entered program with a master's degree earned in the U.S. – **64 hrs**
 - c. If master's degree is not from the U.S. – **96 hours**

2. Total # Hours in BMEN Courses _____

- Available Options {
- a. Entered program without a master's degree – **12 hrs**
 - b. Entered program with a BMEN master's degree earned in U.S. – **6 hrs**
Exception: If master's was earned in BMEN at TAMU, no additional hours are needed.
 - c. If master's degree is not from the U.S. – **12 hrs**
 - d. If master's degree is from another Engineering field – **12 hrs**

I plan to take the following BMEN courses:

3. Total # Hours in Electives _____

- Available Options {
- a. Entered program without a master's degree – **9 hrs** (total includes 1 Life Science elective)
 - b. Entered program with a BMEN master's degree earned in U.S. – Must take a Life Science elective, but no additional electives required
 - c. If master's degree is not from the U.S. - **9 hrs** (total includes 1 Life Science elective)
 - d. Entered program with a master's (earned in the U.S.) in another Engineering field - Must take a Life Science elective, but no additional electives required
 - e. A list of eligible Life Science electives may be viewed in the Ph.D. Program Handbook at <http://biomed.tamu.edu/academics/graduate/handbook.html>.
 - f. May not use 485/685s
 - g. May use BMEN or non-BMEN courses

I plan to take the following electives:

Life Science

4. Communications Course (BMEN 674) **3 hrs**

- a. Required of all Ph.D. students

5. Total # of Seminar (681) Hours _____

- Available Options {
- a. Entered program without a master's degree – **4 hrs**
 - b. Entered program with a BMEN master's degree earned in U.S. – **2 hrs**
 - c. If master's degree is not from the U.S. – **4 hrs**
 - d. Entered program with a master's degree (earned in the U.S.) in another Engineering field – **4 hrs**

Name: _____

UIN: _____

- 6. Total # of Research (691) Hours _____
 - a. The number of research hours can be calculated by taking the sum of 2-5 above and subtracting that from the total hours required on the degree plan (as selected in #1 above).
- 7. Physiology & Other Leveling Courses
 - a. Physiology is required for anyone who has not taken it, regardless of previous degree. VTPP 605 is recommended but may be substituted by taking both semesters of the undergraduate physiology for bioengineers course VTPP 434/435 or the undergraduate biomedical physiology course VTPP 423.
 - b. The physiology course will be entered in the "Prerequisites or Other Courses" section when entering the degree plan online. Although it is required, it will **not** be used on the degree plan or when calculating total degree plan hours.
 - c. If your previous degree was not in Engineering, you will need to work with your committee chair to find out what Leveling Courses you are required to take.
- 8. Committee
 - a. Chair must be a BMEN faculty
 - b. Must have at least 2 additional BMEN members
 - c. Must have at least 1 outside committee member
 - d. Faculty members with joint appointments may serve either as an in-area or out-of-area committee member.

The following faculty members will serve on my committee:

Chair: _____ Dept(s): _____ Email: _____

BMEN Member: _____ Dept(s): _____ Email: _____

BMEN Member: _____ Dept(s): _____ Email: _____

Outside Member: _____ Dept(s): _____ Email: _____

Additional Degree Notes:

- Can transfer a maximum of 24 credit hours for Ph.D. This must be approved by the entire Advisory Committee and the departmental graduate program director before submitting for approval to OGS.
- Up to two upper-level undergraduate courses (300-400) may be used on the degree plan provided that the student's chair and committee approve. Upper-level BMEN courses may **not** be used if the student's undergraduate degree was in BMEN. (Make sure you have approval prior to entering your degree plan online.)

Office Use Only:

Previous Degree: _____ SOAPCOL: _____ SOATEST: _____

Additional Leveling Courses Needed? Y / N

**If yes, contact chair to find out courses needed and list below:*

_____	_____	_____	_____
_____	_____	_____	_____

Planned Coursework for Ph.D. Program

Department of Biomedical Engineering

Note: This form is optional, but it is designed to help you plan your coursework for future semesters. Depending on individual course selection and degree requirements, this form may need to be modified (i.e. inserting or deleting rows/courses where necessary.) To determine individual degree requirements, use the Ph.D. Degree Plan Worksheet, which can be found at <http://biomed.tamu.edu/academics/graduate/handbook.html>.

BMEN	Course	Hrs	Semester	Grade
BMEN				
BMEN				
BMEN				
BMEN				

Seminar	Course	Hrs	Semester	Grade
BMEN	681	1		
BMEN	681	1		
BMEN	681	1		
BMEN	681	1		

Electives	Course	Hrs	Semester	Grade
*				

Research	Course	Hrs	Semester	Grade
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			
BMEN	691			

* Life Science course

Communications Course	Hrs	Semester	Grade
BMEN	674	3	

PLANNED COURSE SCHEDULE:					
FALL	Hrs	SPRING	Hrs	SUMMER	Hrs
20XX		20XX		20XX	
Total					
20XX		20XX		20XX	
Total					

**OFFICE OF GRADUATE STUDIES
PROPOSAL TITLE PAGE FOR
THESIS, DISSERTATION, OR RECORD OF STUDY**

Date: _____

I submit for approval the following research proposal for my: thesis dissertation record of study

Major: _____

Tentative Title: _____

There are compliance issues that must be addressed if graduate students are performing research involving human subjects, animals, infectious biohazards, and recombinant DNA. Students involved in these types of research must check with the Research Compliance Division, Office of the Vice President for Research at 979-845-8585 to ensure that they have met all compliance responsibilities. Additional information can also be obtained at <http://researchcompliance.tamu.edu/>.

A copy of appropriate research compliance approval form must be attached when proposal is submitted.

Approval Recommended:

Name * Committee Chair	Dept.	Student's Signature
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Name Co-Chair	Dept.	Student's Name
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Name (Member)	Dept.	Student's I.D. Number
------------------	-------	-----------------------

Name (Member)	Dept.	Mailing Address
------------------	-------	-----------------

Name (Member)	Dept.	Name (Member)	Dept.
------------------	-------	------------------	-------

Name (Member)	Dept.	Date of Approval :
------------------	-------	--------------------

Name * (Department Head OR Intercollegiate Faculty Chair)
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For the Office of Graduate Studies

* I certify that all research compliance requirements have been addressed prior to submission of this proposal.



PRELIMINARY EXAMINATION CHECKLIST

The student is responsible for completing this checklist before the preliminary exam is scheduled. This checklist must accompany the report of the exam results (using the Office of Graduate Studies (OGS) form, "Report of Preliminary Exam"). The student should initial each appropriate blank indicating that the specified criterion has been satisfied, or where appropriate, been waived. Failure to satisfy the listed criteria will result in the given exam being disallowed in which case it will need to be retaken.

Student's Signature: _____ UIN# _____

Name

1. Registered for semester or 5-week term during which the exam occurs. (If the entire exam is between semesters, then the student must have been registered for the preceding term.)
2. Student has an approved degree plan, which was filed at least 90 days prior to the first written examination.
3. GPR over all eligible courses since beginning graduate work at Texas A&M is greater than or equal to 3.000 as given on SIMS screen 651. (Includes 300 and 400 level courses taken while in a graduate program but does not include transfer courses.)
4. GPR over all courses on the degree plan (excluding transfer courses) is greater than or equal to 3.000 as given on SIMS screen 651.
- 5a. US Citizen
- 5b. Non-US Citizen who has satisfied at least one of the following: (a) a TOEFL score of at least 550 paper based/213 computer based, (b) a GRE-verbal score of at least 400, (c) a GMAT-verbal score of at least 22, (d) satisfactorily passed or waived all portions of the ELPE, or (e) obtained an OGS Waiver.
6. All committee members, have scheduled or waived the written portion and agreed to attend the oral portion of the exam or found a substitute. Only one substitute is allowed; there may not be a substitute for the chair.
7. At the end of the semester in which the exam is given, there are no more than 6 hours of course work remaining on degree plan. (Does not include 691s)

If no, waiver approved by Department Head: _____

8. The time span from the first written to the oral is approximately three weeks. In cases of department-wide written examinations, this criterion is ignored.

If no, waiver approved by Department Head: _____

Approved:

Name:
Advisory Committee Chair

Name:
Department Head OR
Intercollegiate Faculty Chair

Date



Office of Graduate Studies
Texas A&M University
Report of the Preliminary Examination

The undersigned duly appointed examining committee has conducted the preliminary examination of _____ . We have examined the candidate for a mastery of all fields in the program and for an adequate knowledge of the literature in these fields.

Record of Vote for Pass or Failure: (*Votes are to be tallied, e.g., 3 pass; 1 no pass. A positive vote by all members of the graduate committee with at most one dissention is required to pass.*)

_____ **Number of Pass Votes** _____ **Number of No Pass Votes**

If the exam was not passed: The committee, with no more than one member dissenting, (**does**) (**does not**)* recommend that this student be given one re-examination, when adequate time has been given to permit the student to address the inadequacies emerging from this examination.

**Please strike through the inappropriate words in bold face.*

Date _____

Name:	Chair or Co-Chair <i>Please strike through the inappropriate words.</i>
Name:	Co-Chair or Member. <i>Please strike through the inappropriate words</i>
Name:	Member
Name:	Member
Name:	Member
Name:	Member
Name:	Member
Name:	Substitute for _____

Please sign AND print your name:

In compliance with the Texas Open Records Law, the student will be allowed to review this form upon written request.

PLEASE MAKE A COPY FOR YOUR RECORDS AND RETURN ORIGINAL TO THE
OFFICE OF GRADUATE STUDIES

FOR OFFICE OF GRADUATE STUDIES USE ONLY

1. Residence requirement complete: Yes _____ No _____

2. Research proposal approved: Yes _____ No _____

3. Formal course work completed: Yes _____ No _____

4. Other course work remaining: _____

May be admitted to candidacy upon completion of item(s):



Request and Announcement of the Final Examination

(submit to the Office of Graduate Studies at least 10 working days prior to exam)

Permission is requested to hold the final examination for _____

(i.d.# _____) for the degree of _____.

All committee members have been consulted and have agreed to the following schedule:

Date: _____

Time: _____

Location: _____

The student's academic records have been reviewed,
and he/she is qualified to take the final exam.

Approved Chair or Co-Chair

Approved Co-Chair

Approved Department Head of

- pc: _____ Committee Member
- _____ Committee Member
- _____ Committee Member
- _____ Committee Member

(if applicable) _____ will substitute for _____

Office of Graduate Studies Use Only

applied/should apply for _____ graduation	_____ Course work completed _____
_____ ELPE	Lacks: _____
_____ Residency requirement	_____
_____ Overall GPR	Incompletes: _____
_____ Degree plan GPR	_____ Registered
_____ Admitted to candidacy	_____ Exam Approved
_____ Proposal	_____ Oral forms mailed _____
_____ d/p: 90 day rule	_____ Prelims xc: Thesis Office



TEXAS A&M UNIVERSITY

Thesis Office

WRITTEN DISSERTATION (Ph.D.) OR RECORD OF STUDY (Ed.D.) APPROVAL FORM

Student's Name: _____
(Name must match TAMU student records)

Degree (check one): [] Ph.D. (Dissertation) [] Ed.D. (Record of Study)

Date of Defense (mm/dd/yy or Exempt): _____ Today's Date (mm/dd/yy): _____

Anticipated Date of Graduation (Month Year): _____

Major Subject: _____

Dissertation or Record of Study Title: _____

We the undersigned duly appointed committee have read and examined this manuscript and certify it is adequate in scope and quality as a dissertation or record of study for this doctoral degree. We approve the content of the document to be submitted to the Thesis Office for processing and acceptance.

Approved by:

Chair: _____

Member: _____

Member: _____

Member: _____

Member: _____

Member: _____

Member: _____

Member: _____

Head of Department: _____

Student Contact Information:

UIN (Not Social Security Number)

Student's Email Address

The student must submit this signed approval form and a PDF file of the dissertation or record of study to the Thesis Office for review. Students must clear the Thesis Office within a year of their final defense. To graduate in a given semester, a student must meet the scheduled deadline for submittal of the signed approval form and the dissertation or record of study in final form. The Office of Graduate Studies posts a calendar for each semester, and these dates must be observed.

PLEASE TAKE THIS ORIGINAL SIGNED APPROVAL FORM TO THE THESIS OFFICE.