

M.S. and Ph.D. in Materials Science and Engineering

M.S. and Ph.D. in Polymer Engineering

GRADUATE HANDBOOK

Effective August 1, 2011

College of Engineering
Department of Materials Science and Engineering
The University of Tennessee

Welcome to Materials Science and Engineering.

Thank you for choosing the Department of Materials Science and Engineering at The University of Tennessee for your graduate education. We are dedicated to becoming a world class facility for the most recent technological developments in our field. The quality of our faculty, many of which are international leaders in their fields of specialization, assures excellent opportunities for an outstanding graduate education. Our strong ties to Oak Ridge National Laboratories, as well as our involvement in many high-tech partner sites make the MSE department the premier choice for students wishing to develop skills that will ensure exciting careers available all over the world.

We encourage you to explore this handbook, which describes all degree requirements and procedures pertinent to the M.S. and Ph.D. degrees in Materials Science and Engineering and Polymer Engineering. Please do not hesitate to see your advisor or contact me or the director for graduate studies if you have any questions about our programs.

Sincerely,

Kurt Sickafus

Department Head

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1. Introduction

In order to serve the mission and vision of the Graduate School and preserve the integrity of Graduate Programs at the University of Tennessee, Knoxville, information related to the process of graduate education in each department is to be provided for all graduate students. Based on Best practices offered by the Council of Graduate Schools, it is important that detailed articulation of the information specific to the graduate degrees offered in each department/program be disseminated. This Graduate Handbook does not deviate from established Graduate School Policies <http://catalog.utk.edu/content.php?catoid=2&navoid=27> noted in the Graduate Catalog, but rather provides the specific ways in which these policies are carried out.

All graduate students are expected to be aware of and satisfy all regulations governing their work and study at the university. The purpose of this handbook is to describe all degree requirements and procedures pertinent to the M.S. and Ph.D. degrees in Materials Science and Engineering and Polymer Engineering. For general campus policies and procedures, standards of conduct, academic policies and procedures, and information about student support, services, and organizations, please consult the Hilltopics Student Handbook. As a graduate student, you are bound by the Graduate School policies, which are listed in the Graduate Catalog (<http://catalog.utk.edu/index.php?catoid=2>) and can also be found on the Graduate School website, together with appeals procedures (<http://gradschool.utk.edu/GraduateCouncil/AcadPoli/appealprocedure.pdf>) and the Graduate Assistant Handbook (<http://gradschool.utk.edu/GradAsstHandbook.pdf>)

The Department of Materials Science and Engineering offers graduate programs that lead to the degrees of Master of Science and Doctor of Philosophy in Materials Science and Engineering or Master of Science and Doctor of Philosophy in Polymer Engineering. The Graduate Affairs committee oversees all issues relevant to these programs. The committee consists of the following faculty members: V. Keppens (chair), G. Duscher, T. Egami, E. George, Y. Gao, B. Hu, J. Morris, T.G. Nieh, M. Simpson, and S. Wang. Dr. Keppens serves as director of graduate studies for Materials Science and Engineering. Dr. Benson is the director of graduate studies in Polymer Engineering.

2. General duties and responsibilities of faculty and graduate students

All faculty and graduate students in the MSE department are expected to be fully committed to the department's graduate programs. In addition to satisfy the requirements

specific to the MSE graduate programs outlined below, graduate students are expected to satisfy all university regulations in a timely manner.

3. Admission requirements and application procedures

All students who wish to pursue a graduate degree in the department of Materials Science and Engineering must first be admitted through the UT Graduate School. Candidates must have earned a bachelor's degree with grade point average of at least 2.7 at out of 4.0 from a college or university accredited by the appropriate regional accrediting agency or a foreign equivalent. The College of engineering also requires that all students take the Graduate Record Exam (GRE) test when applying for admittance. Additionally, students whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL). Students wishing to apply to the MSE graduate programs must submit two separate application forms: (1) the UT Graduate Application for Admission (with on-line application available at <https://www.applyweb.com/apply/utg/>) to the UT Graduate School, AND (2) the MSE Graduate Student Application to the Department of Materials Science and Engineering (<http://www.engr.utk.edu/mse/forms/grad-app-form.pdf>). The MSE form must be accompanied by three references (Rating Forms are found online at <http://www.engr.utk.edu/mse/forms/grad-rating-form.pdf>).

The MSE Graduate Brochure (http://www.engr.utk.edu/mse/future/grad_brochure.html) includes information about the Materials Science and Engineering Department including summaries of research programs and facilities. Additional information may be obtained by linking to the MSE Web pages on Research and Faculty and Staff.

4. Financial support

Many graduate students in the MSE department receive financial assistance through a Graduate Research Assistantship (GRA). Graduate Research Assistants perform duties in support of university research, which typically relates directly to the students' thesis/dissertation. A student appointed as a GRA works under the direct supervision of his/her major professor. Research assistantships may be financed through funds from gifts, grants, contracts, state appropriations designated for research, or the university's internally sponsored programs. Students who receive financial support are expected to be in residence throughout the calendar year pursuing full time research and study. Typical annual vacation time is two weeks plus University holidays.

5. Registration and advising

All graduate students are admitted to programs of study in either Materials Science and Engineering or Polymer Engineering. The details of these programs are discussed in section 6. Students receiving financial assistance through a GRA should report to the professor providing the support, who will be the student's advisor. Students admitted without financial support should report to one of the Directors of Graduate Studies, there being one for Materials Science and Engineering and one for Polymer Engineering. The Director of Graduate Studies will review the student's background experiences and advise the student on a program of coursework appropriate to the first year of study. A permanent advisor should be chosen before the end of the first semester who will direct the thesis or dissertation, the Director of Graduate Studies serving as the interim advisor. Students are advised to arrange an appointment with each professor active in the chosen program in order to learn about the research projects available. The student should choose carefully, discussing subjects as often as desired with each potential advisor. When an advisor and a research project have been chosen, the student should inform the Director of Graduate Studies of the decision. The Director will then confirm that the advisor is willing and a formal transfer will occur. At this point, a copy of the student's file will be provided to the advisor, who will then assume all advising responsibilities.

For M.S. programs any faculty member may be chosen. For Ph.D. programs only faculty approved by the Graduate School for directing of doctoral students are automatically acceptable; however, other faculty may apply for permission to the Dean of the Graduate School to direct individual students. A list of all potential advisors is given in Appendix 1.

6. Degree requirements

Graduate programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in Materials Science and Engineering or Polymer Engineering. Both the Materials Science and Engineering and Polymer Engineering programs are flexible and interdisciplinary in nature. Students may be admitted from a wide range of disciplines; these include physics, chemistry, chemical engineering, mechanical engineering, electrical engineering, materials engineering, and engineering science programs.

Areas of concentration within the Materials Science and Engineering degree program include materials science, metallurgy, polymers, nanomaterials, biomaterials and energy science & engineering. Specializations include, but are not limited to: ceramics, composites, electronic materials, physical metallurgy, materials processing, welding metallurgy and

materials joining, corrosion science and engineering, biomedical materials, and mechanical and physical behaviors of materials.

Areas of concentration within the Polymer Engineering degree program are polymer processing and polymer science. Specialty areas include rheology and polymer processing; polymer morphology; mechanical, physical and chemical behavior of polymers and composite materials.

I. Master Programs with Thesis

The Graduate School requires that each student has an advisor from the main department and that the student and advisor together select a committee. The committee must consist of the advisor and at least two faculty members at the rank of assistant professor or above. The department requires that the advisor be chosen prior to the end of the first semester of study and that the committee be appointed prior to the end of the second semester of study.

Thesis Registration and Thesis

A student must be registered for course MSE 500 each semester during work on the thesis, including a minimum of 3 hours the semester in which the thesis is accepted by The Graduate School. Six hours of MSE 500 are required for the thesis option. After receiving the Master's degree, a student is no longer permitted to register for MSE 500.

The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the UTK Guide to the Preparation of Theses and Dissertations (<http://web.utk.edu/~thesis/guide10.pdf>). Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each semester (<http://gradschool.utk.edu/ddategraduation.shtml>). Each copy must include an approval sheet, signed by the members of the Master's committee, certifying that they have examined the final copy of the thesis and judged it to be satisfactory. Two additional copies are required by the department for use as future reference documents.

A candidate presenting a thesis must pass a final oral (or oral and written) examination on all work offered for the degree. The examination, which is concerned with coursework and the thesis, measures the candidate's ability to integrate material in the major and related fields, including the work presented in the thesis. This examination, scheduled through your major

advisor, your committee and your academic department (please come by the office to schedule a conference room as soon as your advisor and committee agrees on a date), must be held at least three weeks before the final date for approval and acceptance of thesis by The Graduate School. Final examinations not properly scheduled must be repeated. The final draft of the thesis must be distributed to all committee members at least two weeks prior to the date of the final examination. In case of failure, the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

Students using University facilities and faculty time must be registered for MSE 502 if not registered for other courses.

Candidates have six calendar years from the time of enrollment in The Graduate School to complete the degree. Students who change degree programs during this six-year period may be granted an extension after review and approval by The Graduate School. In any event, courses used toward a Master's degree must have been taken within six calendar years of graduation.

Coursework Requirements

A total of 30 semester hours is required for a M.S. degree in either Materials Science and Engineering or Polymer Engineering.

Additional requirements include:

- For the Materials Science and Engineering major: 12 hours of graduate courses in materials science and engineering consisting of MSE 511, MSE 512, MSE 513, and MSE 514. The Polymer Engineering major must include MSE 539 , MSE 540 , MSE 543 and MSE 552 for the polymer processing and polymer science concentrations; exceptions are given if similar material has been covered in prior course work.
- Additional courses up to 12 hours total in related areas. These courses must include MSE 515 and MSE 516 for the metallurgy concentration; MSE 539 and MSE 540 for the polymers concentration; two graduate specialization courses approved by the student's faculty committee for the materials concentration; two courses from the approved nanomaterials specialization list for the nanomaterials concentration; and two courses from the approved biomaterials specialization list for the biomaterials concentration.
- Master's thesis MSE 500 , totaling 6 to 12 hours.

- Satisfactory performance on a comprehensive oral examination administered by the faculty committee.

All resident students are required to participate in the graduate seminar in materials science and engineering or polymer engineering, as appropriate, during each semester in which it is offered. Three hours of Materials Science and Engineering 503 or 504 may be counted toward degree requirements.

II. *Master Program without Thesis*

Any candidate may apply for a non-thesis option. Upon acceptance, a supervisory committee of three will be appointed. At least two members of the committee will be from the faculty in the major area, either Materials Science and Engineering or Polymer Engineering. The requirements for completion of the non-thesis option are as follows:

- Completion of a total of 30 hours of graduate course work. At least 18 of those hours must be in the department and include the same courses that are required for the thesis-option. Three hours of MSE 503 may be counted toward degree requirements. The faculty committee must approve the candidate's degree program.
- Satisfactory completion of MSE 580 (Critical Review) as a culminating experience. This course shall include a comprehensive examination administered by the faculty committee.

III. *Doctoral Programs*

General Information and Course Requirements

After one year in residence and with the approval of the faculty, a student may proceed directly to the doctoral program without completion of a master's degree.

Departmental requirements for completion of the doctoral degree are:

- Satisfactory performance on the applicable comprehensive examination (see below)
- Active participation in graduate seminars conducted by the department.

- For students proceeding directly to the PhD from the baccalaureate degree, a minimum of 72 graduate hours is required. These hours must include 42 graduate course hours, with at least 6 hours of 600-level courses, and 30 hours of dissertation. Six hours of MSE 503 or MSE 504 may be counted toward degree requirements. At least 24 hours must be courses taught in the department. The materials science and engineering major and the polymer engineering major must include the courses required for the master's program. For students in the nanomaterials concentration at least 12 hours of course work must be from the approved nanomaterials specialization list. For students in the biomaterials concentration at least 12 hours of course work must be from the approved biomaterials specialization list. For students in the Energy Science and Engineering concentration, at least 18 hours of course work must be from the curriculum jointly approved by the center for Interdisciplinary Research and Education (CIRE) and the MSE graduate affairs committee.
- For students having a thesis-based master's degree from UT in materials science and engineering or polymer engineering or a master's degree from another university in materials science and engineering, polymer engineering, or metallurgical engineering, a minimum of 48 graduate hours is required. These hours must include 18 hours of graduate course work with at least 6 hours of 600-level courses and 30 hours of dissertation. Three hours of MSE 503 or MSE 504 may be counted toward degree requirements. For students in the nanomaterials concentration at least 12 hours of course work must be from the approved nanomaterials specialization list. At least 12 hours must be courses in the department. For students in the Energy Science and Engineering concentration, all 18 hours of course work must be from the curriculum jointly approved by the center for Interdisciplinary Research and Education (CIRE) and the MSE graduate affairs committee.
- For students having a non-thesis master's degree from UT in materials science and engineering or polymer engineering, a minimum of 48 graduate hours is required. These must include 15 hours of graduate course work with at least 6 hours of 600-level courses and 33 hours of dissertation. For students in the nanomaterials concentration at least 12 hours of course work must be from the approved nanomaterials specialization list. Three hours of MSE 503 or MSE 504 may be counted toward degree requirements. At least 12 hours must be courses in the department. For students in the Energy Science and Engineering concentration, 18 hours of course work must be taken from the curriculum jointly approved by the center for Interdisciplinary Research and Education (CIRE) and the MSE graduate affairs committee.

- For students having a master's degree in a related discipline, a minimum of 72 graduate credit hours is required. These must include 42 graduate course credit hours with at least six hours of 600-level courses, and 30 hours of dissertation. The courses must also include those required for the Master's program. Three hours of Materials Science and Engineering 503 or 504 may be counted toward the degree requirements. Upon approval of his/her major advisor, the student may petition the department head for acceptance of up to 30 hours of coursework and thesis credits, based on the master's degree, toward the 72 credit-hour requirement. At least 30 of the total 42 course credit hours approved for the degree must be in the materials science and engineering area.

Doctoral Committee

The student and the major professor, who has been chosen during the student's first semester of study, identify a doctoral committee composed of at least four faculty members, holding the rank of Assistant Professor or above, three of whom, including the chair, must be approved by The Graduate Council to direct doctoral research. At least one member must be from a department other than that of the student's major field. This committee is nominated by the department head or college dean and approved by The Graduate School.

The committee should be formed during the student's first year of doctoral study. Subject to Graduate Council policies and individual program requirements, the committee must approve all coursework applied towards the degree, certify the student's mastery of the major field and any cognate fields, direct the research, and recommend the dissertation for approval and acceptance by The Graduate School.

Dissertation Prerequisite

The student must register continuously for MSE 600 (minimum of 3 hours) from the time the doctoral research proposal is approved, admission to candidacy is accepted, or registration for MSE 600 is begun, whichever comes first, including summer semesters and the semester in which the dissertation is approved and accepted by The Graduate School. A minimum total of 24 hours of MSE 600 is required before the dissertation will be accepted. A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of six semesters. The request will be considered by The Graduate School upon written recommendation of the department head.

7. Examinations

I. Comprehensive Examination

The Comprehensive Examination consists of: the Preliminary Examination and the Dissertation Proposal. The Preliminary Examination is usually offered in May for Materials Science and Engineering students, but is offered on request by the student for Polymer Engineering students. All students in Materials Science and Engineering are required to take the Preliminary Examination no more than one academic year following admission to the Ph.D. program. All students in Polymer Engineering are required to take the preliminary examination no more than two academic years following admission to the Ph.D. program. Different examinations are given in each of the two Ph.D. programs, as described below. The Preliminary Examinations are conducted by faculty in the chosen Ph.D. program.

II. Preliminary Examination in Materials Science and Engineering

The Materials Science and Engineering Preliminary Examination will be given in four required parts and one optional part. Each part is graded independently. No student will be allowed to take the Preliminary Examination more than twice, viz. all four required parts must be passed by the second attempt. The four required parts of the examination must be taken during the same examination period. The exams will be prepared by the Materials Science and Engineering faculty and will be "Closed Book," and no notes or other aids, with the exception of calculators, will be allowed. The four required parts primarily consist of: 1) Structure and X-ray diffraction, 2) Kinetics and Thermodynamics, 3) Electronic Properties and 4) Mechanical Properties. These parts will involve questions related to topics covered in MSE 511, MSE 512, MSE 513, and MSE 514. Any student who fails a part of the Preliminary Examination may retake that part the next time the Preliminary Examination is offered. No student will be allowed to take the Preliminary Examination more than twice.

In the special situation where after two attempts, a student successfully passes three parts but fails one part, the student's advisor may request the graduate affairs committee to keep the student in the PhD program under "conditional status". This request has to be made within a month after the results of the prelims are made available to the students. The advisor will need to demonstrate that the graduate student has shown exceptional quality in either coursework or research and has great potential to stand-out as a graduate student. Based on the information provided by the advisor, the graduate affairs committee will decide whether or not a conditional stay in the graduate program is warranted. If the conditional status is granted, extracurricular work designed to strengthen the student's capabilities in the area of deficiency will be assigned to the student by the graduate affairs committee. Upon successful completion

of this work, as determined by the graduate affairs committee, the student will receive notification that he/she passed the prelims and is accepted in the PhD program.

Part 5 of the Preliminary Examination is optional and will be prepared by the student's Doctoral Committee. The decision on whether the student should or should not take part 5 rests on the student's major advisor. This section will be in the student's specialty, and will be administered as a "Take Home" examination with an allowed completion time of two weeks. No assistance, from any source, except already existing documentation in the open "literature," is permitted. The part 5 examination is intended to test the independent thought processes of the student and assess his/her ability to do independent research. The examination, which will be prepared by the student's Doctoral Committee, may consist of one or more of the following: a critical review of specific literature, problem solving, application of specific scientific principles to the dissertation topic, preparation of a proposal for research, or other creative assignments as may be devised by the student's Doctoral Committee. The student will prepare a written response to the assignment (the response document will be typewritten and formally composed) and will submit the document to his/her Doctoral Committee within two weeks. The Doctoral Committee will study the response and (within 1 semester of submission) orally examine the student on the response to the assignment constituting the third section of the Preliminary Examination. The Doctoral Committee will grade the student on a "pass-fail" basis and report the results to the Director of Graduate Affairs within 1 week of the oral examination.

III. Preliminary Examination in Polymer Engineering

The Polymer Engineering Preliminary Examination will be given in four sections. There will be a three-person committee for Sections I-III for each student; the student's major advisor will normally convene that committee. A second three-person committee will be charged with formulating Section IV, a research proposal question. Both committees will normally be composed of Polymer Engineering faculty.

Written questions for Sections I-III (normally one question for each section) may be in several different formats, including, but not limited to:

- (a) a set of questions dealing with a specific subject area
- (b) a critique of a recent important paper
- (c) processing and interpretation of experimental data

- (d) development of a series of experiments using an unfamiliar technique
- (e) a mathematical manipulation of theory

The second three-person committee will formulate Section IV of the Preliminary Examination, which will consist of a proposal-format question on a subject different from the subject of the student's research. The student will have two weeks to prepare and submit a 10 page written proposal. The prelims chair will schedule an oral examination to be one week after the proposal is submitted by the student. The oral presentation of the proposed research will be examined by the committee who wrote the questions, with the major advisor present as an observer. The student may bring to the oral examination any reference materials she/he deems appropriate.

The set of four questions for Sections I-IV will be held by the prelims chair, who will then give them one section at a time to the student when requested to do so (see later). The student will be expected to pass all four sections of the Preliminary Examination. Each of the Sections I-III will be answered by the student within a period of no more than two weeks using a completely open book format. The student is not permitted to consult with anyone, inside or outside the university, during the answering of the question. Questions may be asked of the prelims chair only for clarification purposes. Sections I-III must be answered within a period of 4 months from the time the first question is given. Students may take the Preliminary Examination only once, but may be allowed to retake one of Sections I-III, if the performance is otherwise satisfactory. If the student's performance in Section IV is unsatisfactory, the student may be permitted to retake this section once.

IV. Dissertation Proposal

After passing the Preliminary Examination, and at least one year before defending the dissertation, each candidate needs to submit a proposal describing the proposed research. This proposal and the subsequent oral examination comprise the second part of the Comprehensive Examination. The proposal should contain sufficient detail, by way of literature search and preliminary experimental and/or theoretical development, to allow the examining committee to assess the likelihood of success. The oral examination of the proposal material will be scheduled within one month of submission of the proposal. The examination will be conducted by the student's faculty Ph.D. committee.

The Graduate School rules state that all requirements for the Ph.D. degree must be completed within eight years of the time of a student's first enrollment in a doctoral degree program.

V. Admission to Candidacy

Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated the ability to do acceptable graduate work and that normal progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study has been approved.

A student may be admitted to candidacy for the doctoral degree after passing the comprehensive examination, and maintaining at least a B average in all graduate coursework. Admission to candidacy must be applied for and approved at least one full semester prior to the date the degree is to be conferred. Each student is responsible for filing the admission to candidacy form, listing all courses to be used for the degree, signed by the doctoral committee and approved by The Graduate School.

VI. Dissertation

The dissertation represents the culmination of an original major research project completed by the student. The organization, method of presentation, and subject matter of the dissertation are important in conveying to others the results of such research.

A student should be registered for the number of dissertation hours representing the fraction of effort devoted to this phase of the candidate's program. Thus, a student working full-time on the dissertation should register for 12 hours of 600 per semester.

Two copies of the dissertation (prepared according to the regulations in the UTK Guide to the Preparation of Theses and Dissertations <http://web.utk.edu/~thesis/guide10.pdf>) must be submitted to and accepted by The Graduate School. Each copy must include an approval sheet, signed by all members of the doctoral committee, which certifies to The Graduate School that they have examined the final copy and found that its form and content demonstrate scholarly excellence. Doctoral forms and a thesis card are also submitted at this time. Two additional copies of the dissertation are required by the department for use as future reference documents.

VII. Defense of Dissertation Examination

A doctoral candidate must pass an oral examination on the dissertation. The defense of dissertation will be administered by the members of the doctoral committee after completion of the dissertation and all course requirements. This examination must be passed at least three weeks before the date of acceptance and approval of the dissertation by The Graduate School. The examination must be scheduled through the Graduate Admissions and Records Office. Final examinations not properly scheduled must be repeated. The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination. The examination is announced publicly and is open to all faculty members.

8. Appeals Procedures

Grievances against any policy or action by the University or its personnel may be presented according to the procedures specified in the Hilltopics Student Handbook.

In addition, complaints or disputes involving the Department of Materials Science and Engineering or its personnel may be addressed within the department. When appropriate, the student should request a meeting with his/her advisor, or his/her committee. If a resolution of an issue cannot be achieved with either the advisor or the student's committee, or if the dispute involves them, then the student should request a meeting with the Department Head and any departmental personnel involved in the dispute. If a resolution satisfactory to the student cannot be achieved within the Department, then the student may request a meeting with the Dean of Engineering or may follow procedures described in the Hilltopics Student Handbook. University appeals procedures are listed on the graduate school website (<http://gradschool.utk.edu/GraduateCouncil/AcadPoli/appealprocedure.pdf>).

APPENDIX 1: FACULTY AND THEIR RESEARCH INTERESTS

(* indicates approval to direct doctoral dissertations by The Graduate School)

- * **Roberto S. Benson**, Ph.D., Florida State: *Biopolymers, Polymer Degradation, Composites*
- * **Gajanan S. Bhat**, Ph.D., Georgia Institute of Technology: *Textile Science*
- * **Hahn Choo**, Ph.D., Illinois Institute of Technology: *Powder Metallurgy, Physical/Mechanical Metallurgy, Neutron Scattering*
- * **Gerd Duscher**, Ph.D., Sci., University of Stuttgart: *Interface Science, Analytic (Scanning) Transmission Electron Microscopy*
- * **Takeshi Egami**, Ph.D., University of Pennsylvania: *Amorphous and Nanocrystalline Solids, Neutron and X-Ray Scattering, Electronic Oxides*
- * **Yanfei Gao**, Ph.D., Princeton University: *Computational Materials Science.*
- * **Easo P. George**, Ph.D., University of Pennsylvania: *Mechanical Behavior, Physical Metallurgy, Intermetallics, In-Situ Composites*
- * **Wei He**, Ph.D., University of Connecticut: *Novel Polymers for Tissue Engineering*
- * **Bin Hu**, Ph.D., Chinese Academy of Sciences: *Electronic and Optical Polymeric Materials and Devices*
- * **David C. Joy**, Ph.D., Oxford (UK): *Electron Microscopy, Electron-Solid Interactions, Device Metrology*
- * **“Ramki” Ramakrishnan Kalyanaraman**, Ph.D. North Carolina State University: *Thin Films, Laser Processing, Electronic Properties, Nanocomposites*
- * **Veerle Keppens**, Ph.D., Katholieke Universiteit Leuven (Belgium): *Physical Acoustics, Synthesis and Characterization of Novel Materials*

- * **Kevin M. Kit**, Ph.D., University of Delaware: *Polymer Blends, Agricultural Materials*
- * **Peter K. Liaw**, Ph.D., Northwestern: *Mechanical Behavior, Composite Materials, Life Prediction and Extension*
- * **Carl D. Lundin**, Ph.D., Rensselaer: *Welding, Joining, Non-Equilibrium Metallurgy*
- * **David G. Mandrus**, Ph.D., SUNY Stony Brook: *synthesis and characterization of novel materials*
- * **Carl J. McHargue**, Ph.D., University of Kentucky: *Physical Metallurgy, Ion Implantation in Ceramics, Nanoscience/Technology*
- * **Thomas T. Meek**, Ph.D., Ohio State: *Processing and Electronic Properties of Ceramics*
- * **Charles L. Melcher**, Ph.D. Washington University: *Crystal Growth and Characterization of Novel Scintillation Materials*
- * **James R. Morris**, Ph.D. Cornell University *Computational Materials Science*
- * **T. G. Nieh**, Ph. D., Stanford University; *Metallic Glasses, Nanostructured Materials, Composites, Lightweight Alloys, Intermetallics, Refractory Metals, Thin Films, Bioceramics, Superplasticity, High Temperature Mechanical Properties.*
- * **George M. Pharr**, Ph.D., Stanford University : *Mechanical Behavior, Nanoindentation, Thin Films*
- * **Philip D. Rack**, Ph.D. University of Florida; *Electronic and Optoelectronic Materials, Thin Film Processing and Characterization, and Selective Nanoscopic Processing*
- * **Claudia J. Rawn**, Ph.D., University of Arizona: *Ceramics Processing, X-Ray Diffraction, Neutron Scattering*
- * **Kurt Sickafus**, Ph.D., Cornell University: *crystallography, radiation damage effects, and microstructure of materials.*

- * **Michael L. Simpson**, Ph.D., University of Tennessee: *Electronic Materials, Nanostructured Materials, Nanofabrication, Biomaterials*

- * **Joseph E. Spruiell**, Ph.D., University of Tennessee: *Polymer Processing, Modeling, Structure Development, Fiber Science, Nonisothermal Crystallization, Structure/Property Relations*

- * **Larry C. Wadsworth**, Ph.D., North Carolina State: *Textile Science*

- * **Shanfeng Wang**, Ph.D., University of Akron: *Polymer, Biomaterials and Tissue Engineering*

- * **William Weber**, Ph.D., University of Wisconsin: *Radiation effects in materials*

- * **Yanweng Zhang**, Ph.D., Lund Institute of Technology (Sweden): *Radiation effects in materials*

APPENDIX 2: PERTINENT GRADUATE STUDENT WEB PAGES

- Best Practices in Teaching: http://gradschool.utk.edu/files/2009-10_BPIT-Flyer.pdf
- Center for International Education: <http://web.utk.edu/~globe/index.php>
- Counseling Center: www.utk.edu/counselingcenter
- Department and College: <http://www.engr.utk.edu/mse/> <http://www.engr.utk.edu/>
- Funding, Fellowships, Assistantships for Graduate Students: <http://gradschool.utk.edu>
- Graduate School: <http://gradschool.utk.edu>
- Graduate Catalog: <http://gradschool.utk.edu>
- Graduate Student Appeals Procedure: <http://gradschool.utk.edu/GradAppealHbook.pdf>
- Graduate Student Senate: <http://web.utk.edu/~gss>
- Graduate and International Admissions: <http://admissions.utk.edu/graduate/>
- International House: <http://web.utk.edu/~ihouse>
- Judicial Affairs: <http://web.utk.edu/~osja/>
- Office of Equity and Diversity: <http://oed.utk.edu>
- Office of Minority Student Affairs/Black Cultural Center: <http://omsa.utk.edu>
- Research Compliance/Research with Human Subjects:
<http://research.utk.edu/compliance/>
- SPEAK Testing Program: <http://gradschool.utk.edu/speaktest.shtml>
- Thesis/Dissertation Website: <http://web.utk.edu/~thesis/>
- VolAware: <http://volaware.utk.edu>
- Library Website for Graduate Students <http://www.lib.utk.edu/refs/gradservices.html>
- OIT: <http://oit.utk.edu/>
- Housing: <http://uthousing.utk.edu/sutherland/sutherlandresources.htm>

APPENDIX 3: FORMS AND ADDITIONAL RESOURCES

I. Masters Student Forms

Name: _____

Year/Term	Department	Course #	Course Title	Hours	Grade

Minor:

Year/Term	Department	Course #	Course Title	Hours	Grade

Transfer Credit (A majority of the total hours required for a master's degree must be taken at the University of Tennessee, Knoxville.)

Institution Name: _____

Year/Term	Department	Course #	Course Title	Hours	Grade

(Two-thirds of program, including not more than six (6) hours of thesis credit, must be numbered 500 or above, taken at the University of Tennessee.)

Departmental Approval *(To be completed with the assistance of the academic department)*

We certify that the above program, when successfully completed, meets all coursework requirements for this degree. We also certify that all University regulations regarding research compliances (use of human subjects, animal care, radiation, legend drugs, recombinant DNA, or handling of hazardous materials) have been appropriately approved prior to the initiation of the research if approval is relevant to the applicant's research.

Faculty Committee Signatures
(Print Name)

(Department)

(Signature)

_____	_____	X	_____
(Major Professor)			
_____	_____	X	_____
(Minor Professor or Committee Member)			
_____	_____	X	_____
(Committee Member)			

X

Graduate Program Director Signature

Important: This form will not be accepted by the Graduate School without original signatures of the three committee members and the Graduate Program Director in your department. If you have a minor, one of the three professors must be from the minor department.

TO BE COMPLETED BY THE OFFICE OF
THE UNIVERSITY REGISTRAR ONLY

Diploma Ordered: _____

Diploma Received: _____

GRADUATION APPLICATION FOR GRADUATE STUDENTS

The University of Tennessee
The Graduate School

Submit Form by Deadline to:

The Graduate School
111 Student Services Building
Knoxville, TN
37996-0211

STUDENT INFORMATION

NAME: _____ STUDENT ID #: _____
Last First Middle

(NOTE: the name listed on your official transcript at the university will be the name listed on your diploma unless noted below under "DIPLOMA INFORMATION.")

To assure your addresses are correct go to WWW.CPO.UTK.EDU. Your diploma will be mailed to the PERMANENT ADDRESS listed with the University (CPO).

PHONE: (____) _____ UNIVERSITY EMAIL*: _____

*Information in regards to your graduation status, deadlines, and commencement will be sent to your UTK email address.

X

Signature (Application must be signed and dated before it can be processed.)

Date

DEGREE INFORMATION

TERM AND YEAR OF GRADUATION: FALL _____ SPRING _____ SUMMER _____
(YEAR) (YEAR) (YEAR)

DID YOU APPLY TO GRADUATE IN THE PREVIOUS TERM? YES NO

DEGREE NAME: _____ (Choose One) THESIS/DISSERTATION NON-THESIS
Examples: MA, MBA, MS, MSSW, MSN, MPH, EdS, PhD

MAJOR*: _____

*Please confirm your major/program by logging into CPO. YOU MUST BE ADMITTED TO YOUR PROGRAM BEFORE YOU CAN GRADUATE.

CONCENTRATION: _____

MINOR: _____

DIPLOMA INFORMATION

PLEASE PRINT YOUR NAME BELOW AS YOU WANT IT TO APPEAR ON YOUR DIPLOMA ONLY IF IT IS DIFFERENT THAN THE NAME ON YOUR OFFICIAL TRANSCRIPT.

ADDITIONAL INFORMATION

Students cannot graduate with incomplete grades ("I") or NR on their transcripts.

A new Graduation Application must be submitted if you do NOT graduate in the term for which you have specified on this form.

Information about the Graduate Hooding Ceremony is available online at <http://gradschool.utk.edu/hooding/hoodinginfo.shtml>.

**REPORT OF FINAL EXAMINATION/ DEFENSE OF THESIS
MASTER'S OR SPECIALIST IN EDUCATION DEGREES**

**The University of Tennessee
The Graduate School**

This is to certify that

_____ (student name)

a candidate for the _____ degree,

_____ (passed or failed)

the final examination in partial fulfillment of the requirements.

Date: _____

Student ID #: _____

Committee Names and Signatures

_____	_____
Name (Major Professor)	Signature
_____	_____
Name	Signature
_____	_____
Name	Signature
_____	_____
Name	Signature
_____	_____
Name	Signature

Submit Exam Results by Deadline to:
The Graduate School
111 Student Services Building
Knoxville, TN 37996-0211

Name: _____

List Coursework from Master's degree to fulfill part of requirement for doctoral degree.

Master's Institution Name: _____ Date Awarded: _____

Year/Term	Department	Course #	Course Title	Hours	Grade

Residence Requirement

List the two terms of full-time enrollment used to meet the residence requirement:

* Residence is defined as a minimum of two consecutive terms of full-time enrollment. Individual programs may have additional residence requirements. If using 6-hours enrollment per semester while holding a half-time graduate assistantship, attach a letter of appointment from the department.

Examination and Other Requirements

Comprehensive Examination Passed: _____
Date

Doctoral Language Examination in _____ was passed on _____
(if required) Language Date

Committee Approval and Endorsement

We certify that the above program, when successfully completed, meets all coursework requirements for this degree. We also certify that all University regulations regarding research compliances (use of human subjects, animal care, radiation, legend drugs, recombinant DNA, or handling of hazardous materials) have been appropriately approved prior to the initiation of the research if approval is relevant to the applicant's research.

<i>(Print Name)</i>	<i>(Department)</i>	<i>(Signature)</i>
_____	_____	X
(Major Professor)		
_____	_____	X
(Committee Member)		
_____	_____	X
(Committee Member)		
_____	_____	X
(Committee Member)		
_____	_____	X
(Committee Member)		

X _____
Graduate Program Director Signature

Important: This form will not be accepted by the Graduate School without original signatures of the four committee members and the Graduate Program Director.

TO BE COMPLETED BY THE OFFICE OF
THE UNIVERSITY REGISTRAR ONLY

Diploma Ordered: _____

Diploma Received: _____

GRADUATION APPLICATION FOR GRADUATE STUDENTS

The University of Tennessee
The Graduate School

Submit Form by Deadline to:
The Graduate School
111 Student Services Building
Knoxville, TN
37996-0211

STUDENT INFORMATION

NAME: _____ STUDENT ID #: _____
Last First Middle

(NOTE: the name listed on your official transcript at the university will be the name listed on your diploma unless noted below under "DIPLOMA INFORMATION.")

To assure your addresses are correct go to WWW.CPO.UTK.EDU. Your diploma will be mailed to the PERMANENT ADDRESS listed with the University (CPO).

PHONE: (____) _____ UNIVERSITY EMAIL*: _____

*Information in regards to your graduation status, deadlines, and commencement will be sent to your UTK email address.

X

Signature (Application must be signed and dated before it can be processed.)

Date

DEGREE INFORMATION

TERM AND YEAR OF GRADUATION: FALL _____ SPRING _____ SUMMER _____
(YEAR) (YEAR) (YEAR)

DID YOU APPLY TO GRADUATE IN THE PREVIOUS TERM? YES NO

DEGREE NAME: _____ (Choose One) THESIS/DISSERTATION NON-THESIS
Examples: MA, MBA, MS, MSSW, MSN, MPH, EdS, PhD

MAJOR*: _____

*Please confirm your major/program by logging into CPO. YOU MUST BE ADMITTED TO YOUR PROGRAM BEFORE YOU CAN GRADUATE.

CONCENTRATION: _____

MINOR: _____

DIPLOMA INFORMATION

PLEASE PRINT YOUR NAME BELOW AS YOU WANT IT TO APPEAR ON YOUR DIPLOMA ONLY IF IT IS DIFFERENT THAN THE NAME ON YOUR OFFICIAL TRANSCRIPT.

ADDITIONAL INFORMATION

Students cannot graduate with incomplete grades ("I") or NR on their transcripts.

A new Graduation Application must be submitted if you do NOT graduate in the term for which you have specified on this form.

Information about the Graduate Hooding Ceremony is available online at <http://gradschool.utk.edu/hooding/hoodinginfo.shtml>.

**The University of Tennessee
Graduate School**

Application for Doctoral Language Examination

Submit completed form to:
Graduation Specialists
The Graduate School
111 Student Services Building
Knoxville, TN 37996-0211

Name: _____ Student ID#: _____
Last First Middle

Street: _____ E-mail address: _____

_____ Term exam will be taken: _____
City State Zip (e.g. Summer 09, Fall 09)

Student's Major: _____ Examination in: _____
Language

**Departmental language representative must sign to schedule exam and
submit reading passage to Department of Modern Foreign Languages and Literatures.**

_____ Date
Departmental Language Representative (Signature)

_____ Campus Address of Representative
Departmental Language Representative (Please Print)

FOR GRADUATE SCHOOL OFFICE USE ONLY:

_____ Dean of the Graduate School
Results of the Examination Date

Graduate School - (865) 974-2475 - <http://gradschool.utk.edu/> - gradschool@utk.edu

SCHEDULING DEFENSE OF DISSERTATION

The University of Tennessee
The Graduate School

Submit completed form to:
Graduation Specialists
The Graduate School
111 Student Services Building
Knoxville, TN 37996-0211
Fax: (865)946-1090

So that arrangements can be made for the defense of dissertation, please submit the completed form to the Graduate School **at least one week** before the date of the defense.

_____ Last Name	_____ First Name	_____ Middle	_____ Student ID Number
_____ Street Address			_____ E-mail Address
_____ City	_____ State	_____ Zip	_____ Phone Number
_____ Major			_____ Term Graduating (Semester / Year)

DEFENSE

Date/Time

Building / Room Number

Dissertation Title: _____

List Defense Committee:
(NO SIGNATURES ARE REQUIRED.)

Name (Major Professor)

Department

Name

Department

Name

Department

Name

Department

Name

Department