

Specific Guidelines for DOCTORAL DEGREES

Degrees Awarded:

Doctor of Philosophy (Ph.D.) In Forest Science

Doctor of Philosophy (Ph.D.) In Forest Molecular Genetics and Biotechnology

The doctor of philosophy degree is a terminal research degree. It is awarded in recognition of demonstrated mastery of subject matter in a chosen field of study and demonstrated competence in the conduct of an individual research investigation that represents a significant contribution to the cumulative knowledge of the field. The program of study and research will be planned and supervised by an Advisory committee. Each candidate's course work and research topic must be approved by the advisory committee as meeting the standards generally associated with the doctoral degree. A minimum of 30 course and/or research credit hours **beyond the MS degree** (or its equivalent) or a minimum of 60 course and/or research credit hours **beyond the bachelor's degree** is required.

Completion of Graduate School forms by required dates is the responsibility of the graduate student. Always keep a copy for your files before sending the signed forms down to graduate school. Comprehensive Exams must be completed within **five** years, and all requirements must be completed within **eight** years after first registering. It is advised, however, to complete your comprehensive exams **within first two years of your residence** so that you can focus on your research.

Campus Residency Requirement— Doctoral students must spend at least **four semesters** on campus at MTU beyond attainment of a bachelor's degree, or **two semesters** beyond attainment of a master's degree, in a formal program of study and research under direct supervision of their major advisor. The semesters in residence do not have to be continuous and can include summer terms. In special pre-approved instances, this residency requirement may be waived.

I. ADMISSIONS AND ACCEPTANCE

All incoming students will be expected to have an outstanding ability in previous academic work and will normally have completed a Master of Science program. In exceptional cases, students who have completed Bachelors of Science may also be admitted.

Students will be admitted by the Dean of the Graduate School after evaluation and recommendation by the faculty advisor and Graduate Program Director of the School of Forest Resources and Environmental Science.

Your acceptance in our program is equivalent to submitting Graduate School Form D1, "Acceptance into the Doctoral Program". A specific Graduate School Form D1 should only be filed if you are changing your status from MS to Ph. D.

II. ADVISORY COMMITTEE

Your Graduate Advisory Committee should be appointed before the end of **second semester of residence**. The Advisory Committee consists of a least **four** members, including one member designated as 'Chair'. The Chair is always the student's Advisor. The Chair must be a member of the School of Forest Resources and Environmental Science and the MTU Graduate School faculty. A minimum of **three** other members of your advisory committee, consisting of at least one **'outside'** member is to be selected by the student and his or her Advisor/Chair. The outside

member must be from another department or school within Michigan Technological University. Other committee members can be selected from outside of the MTU community (and not designated as adjunct faculty); however, these members cannot serve as the outside member of Michigan Tech. Your advisor must write a memo to the Graduate School and the School's Associate Dean, asking permission to place someone from outside the MTU community on your Advisory Committee. The memo must also include a justification for having this person (or persons) on your Advisory Committee.

Graduate School Forms D2 “Recommended Advisor” and D4A, “Recommended Advisory Committee”, are due in the Graduate School Office during or before the end of the **second semester of residence**. Changes in the Advisory Committee membership may be appropriate as the student's program evolves. Such changes must be approved in writing by the student's advisor and the School's graduate program Director, with proper notification to the Dean of the Graduate School. The Advisory Committee shall meet with the student early in the period of his or her residence to discuss and prepare an initial program of course work necessary for successful completion of the doctoral program. The list of course work is usually based on what the student may need for one or more of the following: (1) career goals; (2) research project; or (3) expertise needed to fulfill professional goals. The required courses should be listed on **Graduate School Form D3, “Preliminary Program of Study”**. This form is only for student's reference and should not be submitted to the Graduate School Office.

Meetings with the Advisory Committee shall be held at least semiannually to review the student's progress. It should be emphasized that such meetings are to be of tutorial and informative nature. The student will be expected to give a short presentation of his or her progress (course work and research) at these meetings, followed by a discussion. An important goal of these meetings is to help the student develop a high degree of professional competence and confidence.

Students on assistantships or fellowships must enroll for a minimum of nine credits, but not more than 12 credits, each semester (**The school will pay only for maximum of the 9 credits when assistantship is offered**). A grade of “A”, “AB”, or “B” should be obtained in ALL courses listed on your degree schedule; however, up to six credits of “C” may be applied toward your degree if 1) the courses are not the Forest Resources and Environmental Science (FW) courses, 2) are not **required courses for the degree**, and 3) **approved by the Graduate Program Director of the School of Forest Resources and Environmental Science and the student's Advisor**. No grade below a “B” is acceptable for required courses and courses within the School that are applied towards your degree.

III. COURSE WORK REQUIREMENTS

Each doctoral student's course work must be approved by his or her Advisory Committee. A minimum of **30** semester course and/or research credit hours beyond the Master's degree (or its equivalent), or a minimum of **60** semester course and/or research credits beyond the Bachelor's degree is required. Specific School of Forest Resources and Environmental Science course work requirements for Ph.D. students are listed in Table 2.

TABLE 2: Required courses for Ph. D. Students

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- 1) FW5800: Graduate Seminar. Students must register for this class during their first year of residence (credits 1).
 - 2) FW6800: Graduate Seminar. Students must register for this class sometime before their last year in residence (credits 1).
 - 3) FW6980: Graduate Teaching Experience (credits variable up to 4, discuss with your advisor).
 - 4) FW5850: Effective Grantsmanship Workshop (credits 3)(Spring)
 - 5) One Upper Division Statistics class from the list of suggested courses**
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** List of suggested statistics classes

MA 4710 - Regression Analysis
MA 4720 - Design and Analysis of Experiments
MA 4730 - Nonparametric Statistics
MA 4740 - Sampling Methods
MA 4750 - Applied Multivariate Statistics
MA 4760 - Mathematical Statistics I
MA 4770 - Mathematical Statistics II
BL 4470 - Analysis of Biological Data
MA 5701 - Statistical Methods
MA 5711 - Mathematical Statistics I
MA 5712 - Mathematical Statistics II
MA 5731 - Linear Models
MA 5740 - Advanced Sampling Methods
MA 5750 - Statistical Genetics
MA 5761 - Computational Statistics
MA 5791 - Categorical Data Analysis
BE 5550 - Biostatistics for Health Science Research
FW 5411 - Applied Regression Analysis
FW 5410 - Analysis of Natural Resource Data

All graduate students are required to be enrolled each academic term following entry into the PhD program until completion of all degree requirements. A full-time student on an assistantship must enroll for a minimum of nine credit hours per semester and not more than 12 credit hours each semester. During the summer, a full-time student on an assistantship must enroll for one (1) credit hour. Exemptions from this requirement for finite time periods, such as during a co-op employment program, may be obtained, in writing, from the Dean of the Graduate School.

[Research Only Mode petition](#)

Due one week prior to the first day of classes in the semester student plans to enter research only mode. All coursework, comprehensive exam and proposal defense must be completed and appropriate tracking forms must be on file.

IV. PROCEDURES FOR THE DOCTORAL PROGRAM

Doctoral students have three examinations/defenses they need to pass before they can obtain their Ph. D. degree (in the same order): (1) Comprehensive Examination; (2) Research (Dissertation) Proposal Defense; and (3) Final Dissertation Defense. The descriptions of each of these examinations/defenses are given below.

I) Comprehensive Examination

There are two parts to the comprehensive examination: **written and oral**. This exam is given to a student to test knowledge in at least four subject areas. The four subject areas are usually chosen by the student and their Advisor in consultation with the Advisory Committee. It is strongly advised that this exam should be taken and successfully completed within the first two years of enrollment. The following are descriptions of the examination committee and the written and oral examinations.

- 1.) **Examination Committee**: The Examination Committee will be comprised of the student's Advisory Committee. Additional members can be added at the discretion of the Committee, based on the subject areas chosen by the student and the Advisor.

- 2.) **Written Examination**: The written examination is the first exam given and is designed to test the student's knowledge and understanding, as well as ability to synthesize in the following areas:
 - (A) Basic concepts of the four subject areas, including any information necessary to teach an introductory course in these fields;
 - (B) Advanced material in four subject areas; and,
 - (C) Specific aspects of the student's proposed research field/area of specialty. Ultimate acceptance or rejection of answers given by the student on this examination will rest with the Examination Committee. *The written examination is usually taken after the student has completed most of the course work as required by the Advisory Committee. The written portion of the comprehensive examination should generally be scheduled no later than the last semester of the second year of residency.*

- 3.) **Oral Examination**: Subsequent to successful completion of the written examination, an oral examination covering material from the written examination and course work (undergraduate, as well as graduate courses) will be given. The student is expected to demonstrate orally an understanding of the current state of knowledge in those specific research areas. The oral examination must be taken *within one month after successful completion of the written examination.*

The Committee may require **re-examination in some or all areas** or may recommend **termination of the student's program at this time**, depending on the written and oral answers given by the student. Any re-examination must be taken within three months.

Graduate School Form D4, "Report on the Comprehensive Examination," should be submitted to school's Graduate Program Director before end of the second year of residence or at least **two** semesters prior to the research dissertation defense.

Upon satisfactory completion of the Comprehensive Examination, the **Graduate School Form D5, “Degree Schedule,”** *must be filed in the Graduate School Office prior to the semester of the final oral examination.* This degree schedule should include a list of all course work taken in the Masters and the Doctoral Programs. ***The Degree Schedule must be filed and approved prior to scheduling a dissertation defense.*** It must be approved by the Advisory Committee as meeting the standards associated with the Doctor of Philosophy degree.

NOTE: After successful completion of the Comprehensive Exam, the doctoral student becomes a “**doctoral candidate**”.

Research (Dissertation) Proposal Defense

A written research (dissertation) proposal is required of all PhD students. This proposal should include an introduction to the general topic of research, a relevant literature survey, an explicit statement of the hypotheses to be tested and/or goals or objectives of the research, methods needed to complete the research project and preliminary results or supporting evidence as to the legitimacy of the hypotheses.

The student should work closely with his or her Advisor to prepare the proposal. The student should submit the proposal to the Advisory Committee ***at least two weeks before the defense of the proposal.*** The student will be asked to orally defend his or her research (dissertation) proposal usually before the end of **the third year in residence.** The oral defense of the proposal will involve inquiries from the Advisory Committee concerning the student’s knowledge of the subject areas, and his or her proficiency as related to the dissertation research. At this point, the Committee will decide one of three options: (1) accept the proposal with little or no revision; (2) accept the proposal with major revisions; or (3) reject the proposal. Revisions may include a requirement for additional course work. Rejection of the proposal will result in dismissal from the doctoral program. Only option number (1) (acceptance of the research dissertation proposal) will provide the basis for approval of the dissertation proposal. The signed **Graduate School Form D6, “Approval of Dissertation Defense”**, should be sent to the Graduate School Office immediately after the proposal defense.

Final Dissertation Defense

The defense will be given following the successful completion of the Comprehensive Examination and the dissertation proposal defense. The final dissertation defense consists of a public seminar and a closed dissertation defense afterwards with the student’s Advisory Committee. The defense date has to be approved by the student’s Advisor, the School’s Graduate Coordinator and the Dean of the Graduate School. **Graduate School Form D7 “Scheduling of Final Oral Examination”** is due in the Graduate School Office at least ***two weeks prior to the defense.***

Doctoral Dissertation: The research study undertaken as a part of the doctoral degree program will be presented in the form of a dissertation that can be a permanent acquisition of the Library. An expanded abstract, not exceeding 350 words, should also be prepared and submitted electronically to Graduate school and School’s Graduate Program Director. Any classified or proprietary material that cannot be made available to the public is **not acceptable** as a dissertation. The dissertation will be written and prepared under the supervision of the

student's Advisor. A completed draft, prepared in accordance with the 'Instructions Concerning the Preparation of Theses and Dissertations', ***must be presented to the Advisory Committee at least four weeks prior to the final examination.***

Public Seminar: A final oral seminar on the doctoral research and dissertation will be given immediately preceding the dissertation defense. The seminar is open to the public. The candidate should state a short description of past work conducted by others in the research area and justify the objectives and the methods of the research with the results and conclusions contained in the dissertation. The candidate should be familiar with the importance of the particular investigation reported in the dissertation relative to the larger body of existing knowledge. A closed dissertation defense will take place afterwards with the student's Advisory Committee only.

Dissertation Defense: After the final examination has been satisfactorily completed, recommended editorial changes in the dissertation should be made with the approval of the student's Advisor and the Advisory Committee. The results of the examination must be reported to the Graduate School Office using **Graduate School Form D8, "Report on the Dissertation Defense", immediately following the exam, and no later than the first day of the month of commencement.**

Preparation of Dissertation for the Library: At least three copies of the dissertation and a cashier's receipt of payment for each copy to be bound must be submitted to the MTU Library. The Library will forward the copy for microfilming to the Graduate Student Office. An additional copy of the dissertation needs to be given to the School of Forest Resources and Environmental Science

V. CHANGE IN STATUS

Students can change their status from the Doctoral program to a Masters program by submitting a formal, written petition to the Advisory Committee and the School's Graduate Director. Once a change of status is approved, the Graduate School should be notified by the student in the form of a written petition.

Time Line to Degree: PhD

First reconcile this *suggested* chronology with your department's requirements. The sequence may not be the same as written here. Take this time line to a meeting your Advisory Committee to make sure that your goals are consistent with their expectations.

Date: _____

During the first semester of residence or as soon as possible thereafter:

_____ **Acceptance into the Doctoral Program¹ is equivalent to D1 form.** A formal D1 is only required if you are a MTU student and changing status from MS to Ph. D. [*For internal applications from Master's program only*].

_____ **D2, Recommended Advisor**—Your departmental graduate program Director appoints an advisor to meet with you and prepare a program of courses and research work. If at any time you wish to change advisors, it should be approved by the department graduate program Director and reported to the GSO (Graduate School Office). Arrange a meeting with your advisor to work on the D3, D4A and plan your degree path. Do this before **Second Term** on campus.

_____ **D4-A, Recommended Advisory Committee**—Your department graduate program Director appoints an advisory committee of graduate faculty members to meet with you and prepare a program of research work. Any changes in the membership of this committee should be approved by the department chair and reported to the GSO.

- Make sure the Graduate School Office has **official** final transcripts showing proof of your previous degrees (if not from Michigan Technological University).
- Get a **social security number** if you will be a Graduate Research Assistant (GRA) or Graduate Teaching Assistant (GTA), or otherwise working.
- Fill out a **Patent, Research and Proprietary Rights** form in your department office.
- Inform the Office of Student Records and Registration of any changes in your status, address, student identification number, etc.

During the second semester/semester of residence:

_____ **D3, Preliminary Program of Study.** Traditionally, this work contract is a list of all courses you have completed since you received your BS and any additional courses your committee says you should take. Do this by second semester if possible. Subsequent changes in course selections or anticipated completion date can be made on the D5 form. If credit transfers are necessary, use the Transfer Credits form found in this booklet. This form is only for your reference and should not be submitted to GSO.

As work goes on:

_____ **At least two semesters/semesters prior to scheduling the final oral examination** and no more than five years after beginning your doctoral program, you will be given a **written comprehensive exam** and an oral

exam. Satisfactory performance on the comprehensive exam indicates that no additional course work is needed, although you have the option of taking more.

_____ **D4, Report on the Comprehensive Examination.** We hold this form until the oral section of the exam. This exam must be taken at least two terms prior to defense and within 5 years of starting program. The D4 form will be submitted to your graduate program director only and not to GSO.

_____ **D5, Degree Schedule.** The Graduate School Office can start verifying your grades immediately.

¹All these forms can be sent by you or your advisor/department to the Graduate School Office via campus mail. Copies of signed forms will be returned to you and the department.

The Dissertation

Date:

_____ **D6, Approval of Dissertation Proposal.** This should be a statement of your research goal and plan of attack based on your dissertation proposal that should include an introduction to the general topic of research, a relevant literature survey, an explicit statement of the hypothesis(es) to be tested and/or goals or objectives of the research, methods needed to complete the research project and preliminary results or supporting evidence as to the legitimacy of the hypothesis(es).

_____ At least four weeks prior to your defense, send the dissertation draft to your advisory (four-member) committee.

_____ **D7, Scheduling of Dissertation Defense.** Due in the Graduate School Office at least **two weeks before the defense date**, but after the Advisory Committee has **approved** your draft and signed the back of the D7. The defense committee must be comprised of at least four graduate faculty members, including at least one from a cognate department. Non-MTU members of your committee must be pre-approved. Your copy of the signed form will be returned with instructions on how to complete your degree.

_____ **Dissertation Defense.** Take your **D8, Report on Dissertation Defense**, to your defense for signatures. Your advisory/department might hold the signed form until the corrected dissertation is submitted. Your research grades will not be changed until this form is in the Graduate School Office.

_____ After the defense, make corrections as directed and get the new original dissertation signed by the Dean Dr. Peg Gale and your advisor on cover page. Determine how many copies you need to make. The Graduate School requires three copies (two for the Library to bind and keep, and one for microfilming), but you and your advisor/department may want additional copies. Other details of completing your degree will be attached to your copy of the signed D7.

_____ **The Goal: Graduation.** No more than eight years after starting the doctoral program. You must take your dissertation receipt/stamped invoice, UMI

dissertation copy, UMI forms and payment receipt from the Library to the Graduate School Office. You can usually receive a certification letter immediately if all your degree requirements are complete. Your transcript will indicate degree granted by the fourth week of the next semester/semester. If you have left a valid address, your diploma will be mailed to your about 90 days after semester/semester end.

Be sure the Graduate School Office and your advisor are aware of your commencement plans at the **beginning** of the commencement semester/semester.

Forms for the Doctoral Degree

Forms listed below must be downloaded from the MTU Graduate website located at: <http://www.gradschool.mtu.edu/forms/tracking.html#doctoral>

- **D1—Acceptance into the Doctoral Program** (Only for MTU MS Students)
- **D2—Recommended Advisor**
- **D3—Preliminary Program of Study—PhD (for your information only)**
- **D4A—Recommended Advisory Committee**
- **D4—Report on the Comprehensive Examination (For school only)**
- **D5—Degree Schedule—PhD**
- **D6—Approval of Dissertation Proposal**
- [Research Only Mode petition](#)
Due one week prior to the first day of classes in the semester student plans to enter research only mode. All coursework, comprehensive exam and proposal defense must be completed and appropriate tracking forms must be on file.
- **D7—Scheduling of Final Oral Examination**
- **D8—Report on Final Oral Examination**
- **D9—Electronic Thesis and Dissertation Approval Form (Only if you wish your thesis/dissertation to be available via MTU library website)**

Recently in 2008, Graduate school made some changes in their policies. A letter from the Dean of Graduate School is available on the web (http://www.gradschool.mtu.edu/news/Dean_letter_0708.html) and can be seen on the next page.

Letter from the Dean of the Graduate School

July 18, 2008

I want to let you know about some changes to Michigan Technological University's policies regarding graduate student tuition and stipends that will be put into place starting in fall 2008.

The changes were proposed by a group of faculty, graduate students, and the dean of the Graduate School who were given a charge in January 2007 by the Executive Team to examine University policies related to graduate tuition and stipends. The group's final report was presented to the Executive Team in May 2008. [The entire report is available on the President's website at: www.mtu.edu/mtuonly/reports/]. The Executive Team presented its recommendations to the University's Board of Control in June 2008. The Board of Control approved the recommendations that are described below. These changes will become effective in fall 2008.

If you have any comments or questions, please contact either Jackie Huntoon or Nancy Byers Sprague (in the Graduate School). We will try to answer any questions or address any concerns.

Jackie Huntoon, dean of the Graduate School

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- I. **Changes to Tuition Policies:**
 - A. **Old policy:** All graduate students must register for at least 9 credits at the regular tuition rate to be considered full-time.
 - B. **New policy:**
 1. PhD students who have satisfactorily completed both their qualifying and dissertation proposal exams as well as all courses required for their degree (as applicable) can move into full-time research-only mode. The Graduate School will continue to enter documentation of completion of the proposal exam (or equivalent) into BANNER when the D6 form is received in the Graduate School. Departmental staff members will need to continue to enter the results of the qualifying exam (or equivalent exam, typically reported using the D4 form). Students in research-only mode will be eligible to register for full-time research for 9 credits and be charged a graduate research-only tuition rate that is equal to 1/3 of the normal graduate tuition rate at the start of the first semester following the student's completion of the required milestones. Students will petition (using a standard form

[available online](#)) the Graduate School for permission to enter research-only mode.

2. MS students will also be allowed to move into full-time research-only mode at the start of the first semester following completion all required courses as well as the required number of credits for their degree.

C. **Rationale:**

Purpose is to provide assistance to faculty who are supporting graduate researchers on external funds and assist self-supported students who wish to be full-time as well as international students who must be full-time for reasons related to immigration.

II. **Changes to Minimum Stipend Policies:**

A. **Old policy:**

1. All supported MS students were required to receive a minimum stipend of \$4684 per semester during 2007-08.
2. All supported PhD students were required to receive a minimum stipend of \$5438 per semester during 2007-08.

B. **New policy:**

[Table 1](#) summarizes the changes to the minimum stipend levels for MS and PhD students. The Graduate School is working to streamline methods for running BANNER reports that will help departmental staff determine which category the students within their unit fall. A training session for staff members will be offered as soon as the programming is completed that will allow the reports to be generated on a department-by-department or program-by-program basis. Students will be eligible for the increased stipend and the start of the first semester following completion of the required milestones.

C. **Rationale:**

Purpose is to encourage students to complete required milestones and begin working on their research in a timely manner.

III. **Changes to Continuous Enrollment Policies:**

A. **Old policy:**

1. Students who needed time out for special circumstances and due to enrollment in programs with inactive terms enrolled in UN5951 (Graduate Status - Maintenance of Continuous Enrollment). Course carried a \$100 fee. A special “no-fee” section was available for students on active military duty (proof of active status was required), Applied Science Education (SASE) students, and students pursuing online degrees.
2. Students who were engaged in writing or revising a report, thesis, or dissertation while off campus could enroll in UN5952 (Report, Thesis, Dissertation – Independent Writing and Revision) for 0.25 credits.

3. Students who needed to enroll in one credit to comply with Michigan Tech 's requirement that students must be enrolled in a minimum of one credit during their defense semester could enroll in UN5953 (Final Term Graduate Registration).

B. New policy:

1. Allow students who need a "time-out" due to extenuating circumstances (such as illness) or lack of available courses (for students in online or blended degree programs) to register for the no-fee section of UN5951. Graduate School permission (using an online form) is needed prior to registration for this course. The Graduate School will require a doctor's recommendation for a leave of absence if registration in UN5951 is requested due to illness.
2. UN5952 is now eliminated. Students must register for at least one full credit per academic-year semester to remain continuously enrolled.
3. UN5953 will continue to be used for final-semester enrollment and can now also be used for continuous enrollment purposes if it is more appropriate for a student than enrollment in a single credit of thesis research. Departmental permission is needed prior to students' registration for this course. Departments will use the same process that is used to grant permission to register for research credits.

C. Rationale:

Purpose is to eliminate fee for UN5951, eliminate the 0.25 credit course UN5952, standardize the required minimum enrollment, and reduce the financial incentive for students to leave campus prior to completing their degrees.

Table 1: Schedule for minimum stipend rates for MS and PhD students at Michigan Tech during 2008-09. Minimum stipends for the 2007-08 are noted for comparison purposes.

Graduate Student Minimum ¹ Stipend Rate Categories for 2008-09	Minimum 2008-09 Rates	Minimum 2007-08 Rates For Comparison
MS Students	\$ 4,871	\$ 4,684
Incoming PhDs Lacking an MS Degree ²	\$ 5,438	\$ 5,438
Continuing PhDs Lacking an MS Degree	\$ 5,438	\$ 5,438
Incoming or Continuing PhDs with an MS Degree ³	\$ 5,656	\$ 5,438

PhDs After Passing Qualifying Exam (with or without MS)	\$ 5,906	\$ 5,438
PhDs After Passing Qualifying and Proposal Defense Exam (with or without MS)	\$ 6,156	\$ 5,438
<p>1. Departments or faculty can use funds from external or Michigan Tech Fund sources to provide students with higher stipends up to a maximum of \$30,000 per year. Support from Michigan Tech Fund sources can also be used to supplement stipends funded from Michigan Tech's General Fund (i.e., GTA stipends).</p>		
<p>2. Incoming PhD students who lack an MS who have already been made offers of support will be "grandfathered in" and receive support at the 2007-08 minimum PhD stipend level. Beginning in fall 2009, all newly accepted PhD students lacking an MS will receive minimum support at a level equal to the MS rate. After completion of the qualifying exam, all PhD students will receive minimum support at the post-qualifying exam rate.</p>		
<p>3. This stipend rate will be used by Research and Sponsored Programs for all PhD students during the preparation of budgets for proposals to external sponsors.</p>		