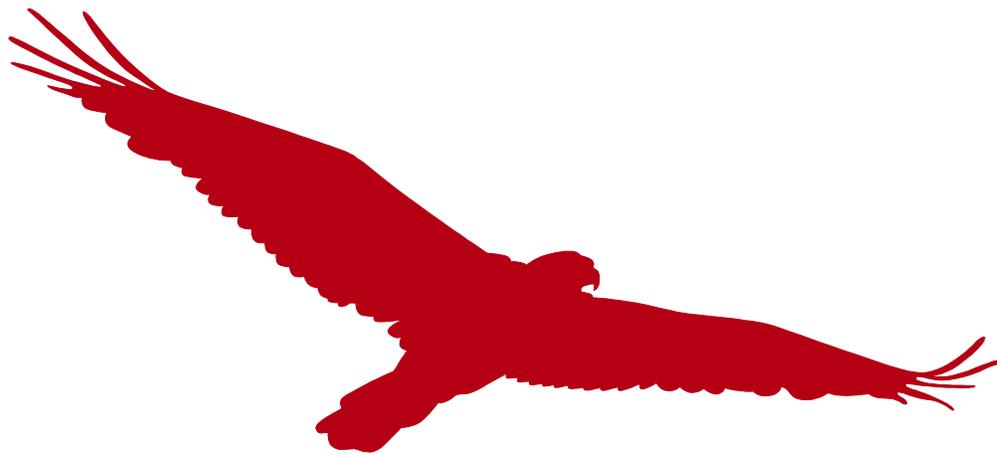




Indiana University of Pennsylvania

Master of Science in Applied Mathematics
Graduate Student Handbook

Department of Mathematics
2019-2020



Handbook Updated Summer 2019

Master of Science in Applied Mathematics
Department of Mathematics
210 S. 10th St., Indiana, PA 15705
Phone: 724-357-2608

Program Website:
<http://www.iup.edu/math/grad/applied-mathematics-ms/>
<http://www.iup.edu/math/grad/applied-mathematics-community-college-ms/>

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IUP's Civility Statement

As a university of different peoples and perspectives, IUP aspires to promote the growth of all people in their academic, professional, social, and personal lives. Students, faculty, and staff join together to create a community where people exchange ideas, listen to one another with consideration and respect, and are committed to fostering civility through university structures, policies, and procedures. We, as members of the university, strive to achieve the following individual commitments:

To strengthen the university for Academic Success, I will act honestly, take responsibility for my behavior and continuous learning, and respect the freedom of others to express their views.

To foster an environment for personal growth, I will honor and take care of my body, mind, and character. I will be helpful to others and respect their rights. I will discourage intolerance, hatred, and injustice, and promote constructive resolution of conflict.

To contribute to the future, I will strive for the betterment of the community; myself, my university, the nation, and the world.

WELCOME

Welcome to the Department of Mathematics! We are delighted that you have decided to join us.

This handbook was developed to answer frequent and important questions related to the M.S in Applied Mathematics program. It does not replace student advising, but is offered as a means of assisting that process. We encourage you to read this handbook carefully, as it will facilitate your advancement through the program. We also expect that you will familiarize yourself with the Graduate School Catalog as it details addresses Graduate School policies (<http://www.iup.edu/graduatestudies/catalog/>).

Using this handbook effectively will enhance the advisement process and enable students to take a more active role in attaining their personal and professional goals. Please contact the program coordinators if you cannot locate information you need in this handbook.

Whether you take the time to review this handbook in depth or not, you will be held accountable to the program's governing principles.

Program Goals

This program will

- Prepare students for lifelong learning and successful careers using their mathematical and statistical skills;
- Train students thoroughly in methods of analysis, computational mathematics, and statistics;
- Develop the skills pertinent to the practice of mathematics and statistics, including the students' ability to formulate problems, to think creatively, and to synthesize information;
- Teach students to use current mathematical concepts and data analysis techniques for problem solving;
- Have students utilize current mathematical and statistical software;
- Develop oral and written communication skills.

Expected Student Learning Outcomes

Upon completion of the program students will have:

- Proficiency with the fundamental knowledge in applied mathematics or statistics,
- Ability to use analytical and computational methods to solve problems,
- Competence to communicate concepts and results to those with or without subject matter knowledge (both orally and in writing),
- Exposure to research talks in seminars and colloquia,
- Involvement in research projects,
- Ability to use current techniques, skills, and tools necessary for computing practice,
- Ability to function effectively on teams to accomplish a common goal,
- An ability to analyze a problem, and identify and define requirements appropriate for its solution.

Faculty and Staff

Program Coordinators:

Dr. Frederick Adkins: fadkins@iup.edu, 724-357-3790

Dr. John Chrispell: jchrispe@iup.edu, 724-357-4763

Internship Coordinator:

Dr. Christoph Maier: cmaier@iup.edu, 724-357-3799

Admission

- The minimum requirements in undergraduate coursework: Calculus sequence, Introduction to Ordinary Differential Equations, Introduction to Probability and Statistics, Introduction to Linear Algebra, Computer Programming
- An Introduction to Mathematical Proof course is strongly recommended.

IUP Graduate Admissions: www.iup.edu/admissions/graduate/

For more information regarding Admission Classification and Provisional Admission for International Graduate Application, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Financial Assistance

- IUP Office of Financial Aid: www.iup.edu/financialaid/

Academic Advisement

- Each student will have an academic advisor, who is responsible for providing advice on course selection.
- Each student is responsible for producing an tentative time plan based on the course rotation and individual interest prior to meeting with the advisor.

Campus Resources & Student Support

The IUP School of Graduate Studies and Research: www.iup.edu/graduatestudies/

Graduate Catalog: www.iup.edu/graduatestudies/catalog/

IUP Office of the Bursar: www.iup.edu/bursar/

IUP Office of the Registrar: www.iup.edu/registrar/

Disability Support Services: www.iup.edu/disabilitysupport/

IUP Campus Library www.iup.edu/library/

MyIUP: www.iup.edu/myiup/

Applied Research Lab: www.iup.edu/ar/

IT Support Center: www.iup.edu/itsupportcenter/

Veterans and Service Members: www.iup.edu/itsupportcenter/

IUP Writing Center: www.iup.edu/writingcenter/

IUP Career and Professional Development Center <http://www.iup.edu/career/>

IUP Parking Services and Visitor Center <http://www.iup.edu/parking/>

University Police <http://www.iup.edu/police/> | 724-357-2141

Crisis Intervention 24/7 Hotline: 1 - 877 - 333- 2470

IUP Email

IUP offers an email account to all active students. **Your IUP email address is the primary means by which the university will contact you with official information and you should use for all IUP official communications. It is your responsibility to check your IUP email regularly.** Visit www.iup.edu/itsupportcenter/howTo.aspx?id=23401 to learn more about setting up this account. For more information regarding University policy on email communication, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Graduate Student Assembly

The Graduate Student Assembly (GSA) represents the graduate student body's interests at IUP and within the Indiana community. The GSA makes recommendations related University-wide and graduate-specific policies and in areas of concern in the cultural, intellectual, and social life of the part- and full-time graduate student. Visit www.iup.edu/graduatestudies/gsa for more information.

Programs and Degrees

Master's Program

❖ *The MS in Applied Mathematics consists of the following graduate courses: (Total 33–36 credits)*

I. CORE COURSES* (15 CREDITS)

MATH 545: *Deterministic Models in Operations Research (3 credits)*

MATH 546: *Probabilistic Models in Operations Research (3 credits)*

MATH 563: *Mathematical Statistics I (3 credits)*

MATH 564: *Mathematical Statistics II (3 credits)*

MATH 625: *Analysis for Applied Mathematics (3 credits)*

**Required unless comparable courses have been taken at the undergraduate level. No more than 3 credits may be waived from a total of 30 credits of coursework.*

II. CONTROLLED ELECTIVES† (15 CREDITS)

MATH 523: *Complex Variables (3 credits)*

MATH 547: *Modeling and Simulation (3 credits)*

MATH 551: *Numerical Methods for Supercomputers (3 credits)*

MATH 640: *Numerical Mathematics (3 credits)*

MATH 641: *Ordinary and Partial Differential Equations (3 credits)*

MATH 643: *Graphs, Networks, and Combinatorics (3 credits)*

MATH 645: *Nonlinear Programming Models (3 credits)*

MATH 647: *Advanced Simulation (3 credits)*

MATH 665: *Applied Regression Analysis and Design of Experiments (3 credits)*

MATH 667: *Applied Statistical Methods (3 credits)*

†At least 12 credits must be at the 600 level.

III. ADDITIONAL ELECTIVES‡

Other graduate-level mathematics courses may be selected with approval of the student's advisor. Also, with the advisor's approval, up to six credit hours of graduate work may be taken in disciplines such as chemistry, computer science, economics, finance, management information systems, and physics.

‡The MS in Applied Mathematics requires a minimum of 27 credits of course work in addition to the research requirement listed below.

IV. RESEARCH REQUIREMENTS (3–6 CREDITS)

- Option I MATH 795: Thesis, 3 cr., or
 Option II MATH 698: Internship, 6 cr.

❖ *The MS in Applied Mathematics-Community College Track consists of the following graduate courses: (Total: 33–36 credits)*

I. CORE COURSES* (15 CREDITS)

- MATH 545: *Deterministic Models in Operations Research* (3 credits)
 MATH 546: *Probabilistic Models in Operations Research* (3 credits)
 MATH 563: *Mathematical Statistics I* (3 credits)
 MATH 564: *Mathematical Statistics II* (3 credits)
 MATH 625: *Analysis for Applied Mathematics* (3 credits)

**Required unless comparable courses have been taken at the undergraduate level. No more than 3 credits may be waived from a total of 30 credits of coursework.*

II. CONTROLLED ELECTIVES (18–21 CREDITS) †

- Choose two from: MAED 611, MAED 613, MAED 614, MAED 654
- Choose two from: MATH 640, 641, MATH 643, MATH 645, MATH 665, MATH 667
- Choose one from: MATH 521, MATH 523, MATH 527, MATH 553, MATH 576
- Choose one from: Thesis (3 credits), Internship (6 credits) (option for teaching or industry setting)

† Each course is 3 credits unless indicated otherwise.

Course Descriptions

Course descriptions can be found in the following URL:

<http://www.iup.edu/graduatestudies/catalog/course-descriptions/math--mathematics/>

Course Rotations*

Even Year		Odd Year	
Fall	Spring	Fall	Spring
MATH 546 <i>(Probabilistic Models in OR) (Req)</i>	MATH 647 (Advanced Simulation) MATH 665 (Applied Regression Analysis and Design of Experiments)	MATH 563 <i>(Mathematical Statistics I) (Req)</i>	MATH 545 <i>(Deterministic Models in OR) (Req)</i>
MATH 641 (ODE/PDE)	MATH 550 (Topics in Applied Computational Mathematics)	MATH 625 <i>(Applied Mathematical Analysis) (Req)</i>	MATH 564 <i>(Mathematical Statistics II) (Req)</i>
MATH 667 (Applied Statistical Methods)		MATH 640 (Numerical Mathematics)	MATH 645 (Nonlinear optimization)-Alternates with MATH 643
MATH 547 (Modeling and Simulation)			(Graphs, Combinatorics, Networks)

* If you are in the community-college track, please meet with Dr. Adkins or Dr. Kuo to determine your schedule.

All courses listed above are usually offered during late afternoon to evening on Monday to Thursday. MATH 563 is offered every fall semester starting Fall 2016; however, it may be during the day-time.

Evaluation of Students

For more information regarding School of Graduate Studies and Research Policy on grading, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Degree Completion

Requirements for graduation include that each student must complete at least 9 courses and fulfill all program requirements including five required courses (*italic text in the course rotation table*) and five elective courses, plus 6 credits in internship or 3 credits in thesis. You must maintain a minimum GPA of 3.0. At least 50% of your total credits must be at or above the 600 level. The program coordinator will review the graduation application according to the curriculum requirements.

For more information, view the view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

For access to forms processed through the School of Graduate Studies and Research, click on *Current Students*: <http://www.iup.edu/graduatestudies/>

Thesis Completion

Thesis Defense Protocol

1. The candidate must send the thesis to the committee members at least two weeks prior to the day of the defense.
2. The announcement of the defense should be sent out by the committee chair at least one week prior to the day of the defense.
3. The defense of a thesis/dissertation is open to the public. The committee will have the opportunity to continue communication with the candidate in a closed session.

Evaluation Outcome for Thesis

The potential outcomes of the thesis defense are pass, pass with revision, revise and resubmit, fail.

Effective for students enrolled beginning or after fall 2017: Dissertation and thesis credits will be assigned Pass or Fail as the final evaluation outcome for the taken credits and carry no quality points weighted towards a student's CGPA.

Ongoing Dissertation and Thesis students admitted "prior" to fall 2017 – Dissertation and thesis credits will be assigned a letter grade as the final evaluation outcome for the credits taken and carry quality points weighted towards a student's CGPA for the number of dissertation credits required for the program. "Extended" dissertation credits are not calculated into a student's CGPA.

For more information, view the view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Access forms processed through the School of Graduate Studies and Research, click on *Current Students*: <http://www.iup.edu/graduatestudies/>

University Policy and Procedure

University policy is the baseline. Programs may have policies that are more stringent than the baseline policy; however, not less stringent than the baseline policy. For questions regarding this statement, please contact program coordinators or the School of Graduate Studies and Research.

Academic Calendar

View the IUP Academic Calendar: www.iup.edu/news-events/calendar/academic/

Academic Grade Appeal Policy

For Information regarding the Grade Appeal policy, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Academic Integrity

Students are to work on assignments independently, except for those specified by the instructor. Homework solutions and computer code are not to be shared with others. Doing so may result in serious repercussions for your academic standing. Preparing submissions independently means:

- Collaborative discussions are encouraged, but do not sit down with another person and write out the solution to a problem or coding assignment together.
- Do not copy or make use of another person's solution or code, and do not allow another person to copy or make use of yours.

For more information, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/
The Source: A Student Policy Guide: www.iup.edu/studentconduct/thesource/

Academic Status and Satisfactory Academic Progress

For more information, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Affirmative Action

Indiana University of Pennsylvania is committed to providing leadership in taking affirmative action to attain equal educational and employment rights for all persons, without regard to race, religion, national origin, ancestry, sex, physical handicap, or affectional or lifestyle orientation. This policy is placed in this document in accordance with state and federal laws including Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973 as well as federal and state executive orders. This policy extends to disabled veterans and veterans of the Vietnam era. Please direct inquiries concerning equal opportunity to: Office of the Provost, 205 Sutton Hall, 1011 South Drive, IUP, Indiana, PA 15705-1046 U.S.A.

Bereavement-Related Class Absences

For Information regarding the Bereavement-Related Class Absences policy, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Continuous Graduate Registration for Dissertation and Thesis

***Note: Admission effective fall 2017 and after:** Master's thesis, MFA thesis and Doctoral dissertation students beginning programs in fall 2017 and thereafter, must adhere to the following Continuous Graduate Registration policy for Dissertation and Thesis.

*Following completion of course work, including internship or practicum; (excluding comprehensive exam or qualifiers) **all** doctoral and master's thesis students must be continuously enrolled for at least one credit of dissertation or thesis each semester (Fall and Spring) annually, through the graduation of the student or until the time limit is exceeded. There is no separation between completions of course work, internship or practicum and initiation of dissertation or thesis credit registration.*

Once the student has registered for the number of dissertation credits required by the program of study (typically nine or twelve), or the number of thesis credits required by their program of study (typically three to six), she or he must register for one dissertation or one thesis credit each semester (Fall and Spring) annually through the graduation of the student or until the time limit is exceeded (See Time Limitation Policy for doctoral or master's students). For this period, the student will be considered a full-time doctoral or master's student.

All dissertation and thesis credits will be pass/fail credits. Students must complete the minimum number of dissertation or master's thesis credits required by their program, but may take additional dissertation or thesis credits as is necessary to comply with the Continuous Graduate Registration for Dissertation and Thesis policy.

Until the dissertation or thesis is successfully defended, a grade of "R" will be assigned to each registered credit. Upon successful completion of the dissertation or thesis, the grade assigned by the dissertation or thesis director will apply to all registered dissertation or thesis credits. Students must pay tuition and mandatory university fees for all credits (equal to the part-time mandatory fees), and may choose to pay the Wellness Fee.

Graduate Fresh Start Policy

A graduate student who has been separated from the university because of academic dismissal, including time-to-degree dismissal, may only apply for readmission to the University if the student has been separated from the university, for a minimum of two calendar years (24 consecutive months) from the date of dismissal. The request to be considered for readmission to the University must be into a graduate program, and readmission to the program from which the student was dismissed may not be sought. A student dismissed because of an academic integrity violation is barred from utilizing the Graduate Fresh Start Policy to request readmission.

Conditions for a Graduate Fresh Start Application

A graduate student may apply for a Graduate Fresh Start only if he/she meets all the following conditions:

- he/she was academically dismissed, including time-to-degree dismissal from an IUP graduate program;
- he/she has been separated from the university for a minimum of two calendar years (24 consecutive months);
- he/she applies for readmission consideration to a graduate program at IUP, excluding the program from which the student was academically dismissed.

The graduate student must apply to the desired program through the standard Admissions process. Having reviewed the prior and intervening factors for evidence of potential for improved academic success, the program coordinator, after departmental review, may recommend to the Dean of Graduate Studies and Research that the student be readmitted to the University and admitted to the program. The Dean's decision is final and is not subject to appeal.

Conditions for a Graduate Fresh Start Record

All credits and grades for IUP course work taken before readmission under this Graduate Fresh Start Policy shall remain on the transcript. Upon readmission, a new cumulative (GPA) is established based on credits and grades earned from the date of readmission. Individuals may seek readmission to the University through the provisions of this policy only once.

Prior Record

The student's graduate record will be identified as a Graduate Fresh Start. No graduate credits earned from the program in which the student was dismissed are permitted to be transferred to the Graduate Fresh Start sought degree. Any other transfer credits must meet the IUP Transfer Credit Policy.

Students seeking a degree under the Graduate Fresh Start are not permitted to repeat a previously taken course from the program in which the student was dismissed and have it count towards improving the previous CGPA that was prior to readmission. Any course repeat(s) will be counted as a course taken under the Graduate Fresh Start and applied solely to the new degree sought and new cumulative GPA.

Academic Standards

A student who is readmitted under the provisions of the Graduate Fresh Start Policy shall be required to meet current degree requirements. He/she shall be academically reviewed under the policies published in the academic catalog at the time of re-matriculation. Students readmitted to the University under this policy and who were dismissed initially by exceeded time-to-degree requirements may not be granted extensions of time-to-degree requirements.

Graduation Graduate Residency Requirement Policy

1. For master's students, at least 2/3 of the credits meeting program requirements must be taken from the University offering the degree.

Note that these set the minimum number of credits that must be taken "in residence" and that universities can limit the number of hours that will be allowed to transfer into a graduate program. Active-duty service members who are graduate students will be handled on a case by case basis.

Exceptions are to be approved by the Office of the Chancellor's Division of Academic and Student Affairs.

Program Level Exams Appeal Policy

Appeals for Program Level Exams such as, candidacy, comprehensive, or qualifying examinations, are made to the Dean of the School of Graduate Studies and Research (SGSR) based on policy and/or procedural violations. The appeal can be based only on policy and/or procedural violations; and not simply on the outcome of the examination. Procedural violations would be cases in which the program / department failed to follow program/ department and/or University policies and/or procedures relating to the administration and/or evaluation of the exam.

The appeal must be made in writing to the Dean of the School of Graduate Studies and Research. Documentation of the policy(ies)/procedures in question must be provided, along with a detailed description of the alleged violation(s). All evidence supporting the alleged violation should also be provided. The student must submit the written appeal to the Dean of the SGSR within 30 days of receipt of the outcome of the examination.

Upon receipt of the written appeal to the Dean of the SGSR, the Dean will conduct an investigation of the allegation, review the documentation and render a final decision which completes the appeal process. The final decision rendered by the Dean of the SGSR may not be appealed.

If it is found that policy/ and/ or procedure has been violated, the Dean of the SGSR will instruct the program/ department to allow the student to retake the exam, fully adhering to policy and procedures. In the event of a finding in support of the student allegation, the reexamination may not be counted as one of the attempts permitted under the University or Department's Reexamination Policy.

Reexamination Policy: Candidacy/Comprehensive Examination

No student is permitted a "third" examination without a recommendation to that effect from the degree program's sponsoring department per their adopted written procedures and the approval of the School of Graduate Studies and Research Dean (or designee). Exceptions to this policy for programs can be made only with the approval of the School of Graduate Studies and Research.

The program does not require Comprehensive Exams or Candidacy.

Registration

Graduate students are expected to register for classes within the guidelines posted on IUP's Academic Calendar (www.iup.edu/academiccalendar). Before registering for the Fall or Spring terms, remember to meet with your advisor to obtain the "Alternate PIN" necessary for online registration. An "Alternate PIN" is not required for Summer registration. <http://www.iup.edu/registrar/students/registration/>

For more information regarding registration and tuition billing, please contact the Office of the Bursar: www.iup.edu/bursar/

Social Equity

The Office of Social Equity: www.iup.edu/socialequity/

For more information regarding University policy, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Student Conduct

Policies from the Office of Student Conduct: www.iup.edu/studentconduct/policies/

Time Limitations

Masters students must complete degree requirements no later than five years from the date of earning or transferring credit, unless the period is extended through student petition. Petitions are approved by the student's department and the dean of the School of Graduate Studies and Research.

For more information regarding School of Graduate Studies and Research policy on registration, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Time-to-Degree Masters/Doctoral Dismissal Appeal Policy

A student dismissed from a program because of time-to-degree expiration (see Time Limitations policy) can appeal the decision to the Dean of the School of Graduate Studies and Research (SGSR), based on policy and/or procedural violations. The appeal can be based only on policy/procedural violations.

The appeal must be made in writing to the Dean of the School of Graduate Studies and Research.

*Documentation of the policy(ies)/procedures in question must be provided, along with a detailed description of the alleged violation(s). All evidence supporting the alleged violation should also be provided. The student must submit the written appeal to the Dean of the SGSR **within 30 days** of receipt of the dismissal letter.*

*Upon receipt of the written appeal to the Dean of the SGSR will conduct an investigation of the allegation, review the documentation and render a final decision **which completes the appeal process. The final decision rendered by the Dean of the SGSR may not be appealed.***

If it is found that policy/and/or procedure has been violated, the Dean of the SGSR will rescind the dismissal.

- a. Masters student time limitation (see Time Limitations policy) may be extended through student petition to the Assistant Dean of the SGSR. The program coordinator on behalf of the student, no later than the first day of the month of the student's time-to-degree expiration date, makes the request to the Dean (or designee) of the SGSR. The request must include justification for the extension. Official documentation to justify the request for the extension and the amount of time will be required by the Dean (or designee) of SGSR to support the request.*

Title IX Reporting Requirement

For more information regarding Title IX Reporting Requirement policy, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Transfer of Credits (Effective fall 2017) Policy

A student may transfer graduate credits from another institution, with Department approval, up to one third (1/3) of the required credits for the graduate student's program at IUP. These graduate courses must have been taken from a regionally accredited institution, within the past five years, and the grade earned must be a "B" or its equivalent or better. The time limitation rule and residency requirements pertain without modification to transfer credits.

Up to one third (1/3) graduate credits originally earned in one graduate program at IUP may be applied toward a different graduate program if: 1) the receiving department and 2) the School of Graduate Studies and Research both approve the credits as meeting degree requirements. These courses must have been completed within the past five years, and the grade earned must be a "B" or its equivalent or better.

The combination of transfer graduate credits earned at another institution and those earned at IUP may not exceed one third (1/3) of the total required graduate credits for the program.

To request transfer credits, the student must complete the Request for Graduate Transfer Credit Review form

and follow the instructions listed on the form. A catalog course description or course syllabus must accompany the request. An official graduate transcript showing the earned graduate credits must be provided by the school at which the credits were taken. To be considered official, the transcript must arrive in a sealed envelope bearing the official seal of the issuing institution. The request is reviewed in the School of Graduate Studies and Research and the academic department. After review, the student's program coordinator and the student are notified of the transfer decision.

It is strongly recommended that students seeking to transfer graduate credits from another institution while enrolled at IUP receive advance written authorization for credit acceptance from the School of Graduate Studies and Research and the academic department prior to enrolling in that course.

If graduate credits earned at another institution are approved for transfer, only the credit, not the grade or accompanying quality points, will appear on the student's IUP transcript.

Graduate credits earned at IUP that are approved for transfer to a second program will not be posted to the transcript a second time.

Research

Applied Research Lab: www.iup.edu/ar/

For more information, visit the website of the School of Graduate Studies and Research, click on *Research*: www.iup.edu/graduatestudies/

Student Rights and Responsibilities

For more information regarding student rights and responsibilities, view the Graduate Catalog: www.iup.edu/graduatestudies/catalog/

Appendices

What Faculty Expect of Students

Graduate students are expected to be familiar with course syllabi and attend class regularly. Students should actively participate in their own learning, both inside and outside of class. Questions on course material should be brought to the instructor's attention. All course assignments should be turned in on time. As a graduate student, your assignments should be well-presented. Faculty may require assignments to be typed (including complex mathematical formulas). At all times, graduate students are expected to conduct themselves in a respectful manner conducive of a positive learning environment.

What Students Can Expect of Faculty

In fulfillment of teaching obligations, you can expect faculty to select course content that is appropriate and assign work that enhances student understanding of the content. Assignments will be graded carefully, objectively, and returned in a timely manner. Faculty will be competent in using technology and capable of using collaborative approaches to teaching and learning. You can also expect that the faculty will treat each student respectfully and be available and welcoming during scheduled office hours. Instructors are also available by appointment, as well as before, during, and after class.

You can also expect faculty members to actively participate in scholarly growth and to contribute to the department, college, and university through a variety of service activities. Faculty members will facilitate growth in your professional development in each of these areas. As appropriate to the individual student, this can include apprenticeships in research in which the student learns how to define research problems. It may also mean participation in service experiences and socialization to the norms of the mathematical community.

Extra-Curricular Activities

1. Annual Department Events: The department hosts picnics and annual research presentation days. Students are welcomed and encouraged to attend departmental events.
2. Departmental Clubs: All students are welcome to participate with the Math Club or the Actuarial Club. You can also start your own club!
3. Colloquia: The Mathematics Department colloquia will be announced during the semester. Please pay attention to the flyers and announcements on the web. Contact the chair of the Colloquium Committee if you are interested in giving a presentation.
4. Professional Organizations: Students are encouraged to participate in professional organizations which are free or have discounted rates for students. Professional organizations offer students the opportunity to present or attend regional and national meetings.
 - Society for Industrial and Applied Mathematics: www.siam.org
 - As the department has the membership, students are encouraged to sign up for a free SIAM membership: <http://www.siam.org/students/memberships.php>
 - American Mathematical Society: www.ams.org
 - Mathematical Association of America: www.maa.org
 - Institute for Operations Research and the Management Sciences: www.informs.org

External Resources

Mathematics Publication Database: <http://www.ams.org/mathscinet/>

Thesis Guidelines

The Thesis and Dissertation Manual (TDM) is the governing document and provides detailed information regarding the thesis process. You are responsible for knowing and understanding the contents of this manual. The TDM is available at the School of Graduate Studies and Research Web site: <http://www.iup.edu/graduatestudies/resources-for-current-students/research/thesis-dissertation-manual/>

The following are meant to serve as a general guide as you immerse yourself in the thesis process. Succinctly, the topics contained in the TDM can be broadly divided into four major categories:

1. **Deadlines, Forms, Checklists, and Instructions** – You must know and be aware of all deadlines associated with the thesis process. You must complete and submit all necessary forms on time. Be absolutely certain that you have addressed all items on all checklists contained in the TDM and that you have carefully followed all of the instructions for the various processes addressed in the TDM.
2. **Thesis Committee** – Choose your thesis advisor carefully. Your advisor should be eligible to be the chair of your thesis committee, and be knowledgeable in the area related to your thesis. For instance, if you are writing a Master's Thesis in the field of statistics, then you should select a statistician as your advisor. The other members of your thesis committee also should be knowledgeable in the area related to your thesis. You should communicate frequently with the members of your thesis committee.
3. **Responsibilities** – Acclimate yourself not only with your responsibilities but also with the responsibilities of all of those individuals involved in the thesis process.
4. **Format and Style** – There are several formatting and style rules that your thesis is required to follow. These rules are specific and failure to follow them will result in your thesis not being accepted by the School of Graduate Studies and Research.

With regard to the actual writing of your thesis, it is important to write intelligently, both in a grammatically and mathematically correct fashion. A poorly written thesis is unacceptable. An effective way to improve your writing skills is to carefully observe how mathematics is written in textbooks and published research papers. Upon request, the Mathematics Department may provide resources which you may use to facilitate a properly written thesis.

In addition to any requirements contained within the TDM, the Mathematics Department strongly suggests that your thesis be typeset using a LaTeX compatible typesetting software package. Packages such as Scientific Notebook and MiKTeX are recommended and freely available. There are sample style files available for you to use in each of the recommended software packages. These files will include sample shells in which you can insert the contents of your thesis.

Internship Guidelines

Overview:

Internship experience is valuable for any mathematics student who is considering a career in industry or in government agencies. Real world experience gives graduates advantages in job applications. You should contact the internship coordinator for more detail information.

Graduate internships carry up to 6 credit hours. All interns are assigned a faculty supervisor by the internship coordinator. In an internship, students usually work for 6–15 weeks and complete other requirements dependent on the position.

Finding a good internship requires considerable effort. It is very important that the interested student meet with the internship coordinator early in the Fall semester to craft a resume and start a search in a timely manner. The student will be assisted in the search by the department internship coordinator, but it is ultimately the student's responsibility to find an internship.

Internship Qualifications:

1. All graduate interns must have completed a minimum of 12 semester hours, with a minimum 3.0 GPA, before their internships commence.
2. All interns must submit a resume approved by the internship coordinator. It is recommended that this step be completed at least one full semester prior to the semester that the student wishes to do the internship.
3. No interns may earn more than 6 credits for an internship. Forty hours of work equals one credit hour, so a 6-credit internship requires 240 hours of internship work.
4. Graduate students must register for the departmental internship course MATH 698 to receive IUP credits for the internship.
5. Interns must also complete the math department's electronic experiential education information form before commencing their internship.

Intern Responsibility:

Interns are expected to complete the following requirements:

- a) Record daily activity logs.
- b) Provide weekly updates to the faculty supervisor.
- c) Write a final written report.
- d) Give a final oral presentation.

The log should list the tasks that are performed each day. It should also mention skills and tools that are learned or used. It may include personal impressions and feelings about the job.

The final written report should be typed and should summarize the internship project(s). It should contain a description of the work assigned as well as a description of the actual work accomplished. It should also contain a statement concerning the professional and personal benefits derived from the internship.

The final oral presentation is a summary of the final written report and will be followed by a question/answer session. The presentation will be opened to interested students, faculty, and company

personnel. The intern should meet with the faculty supervisor and the site internship supervisor before the proposed presentation to discuss content of the oral presentation.

All requirements of the internship must be completed before a grade is assigned. Grading will be based on the evaluation of the above requirements, on the site supervisor's midterm and final evaluations, and on other feedbacks about the intern gained from on-site visits by the faculty supervisor and from communications between personnel at the internship site and the faculty supervisor.

Signature Page

My signature below indicates that I am responsible for reading and understanding the information provided and referenced in this department/program student handbook.

_____ [please initial] I understand my program coordinator may share this document with the School of Graduate Studies and Research.

Print Name

Signature

Date

Submit to Dr. Yu-Ju Kuo by the end of the first week.

The Department of Mathematics will keep this signed document on file.