

IUP Graduate Handbook

Master of Science in Applied Mathematics

Department of Mathematical and Computer Sciences

Handbook Updated Summer 2020

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-community-college-ms/

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INTRODUCTION

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.

www.iup.edu/ gradcatalog

Title IX Reporting Requirement

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

Student Conduct and Student Rights

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

Department of Mathematical and Computer Sciences

Information about the **deartment** is found at: https://www.iup.edu/math-computer-sciences/

Mission Statement and Program Objectives

This program will:

- x Prepare students for lifelong learning and successful careers using their mathematical and statistical skills;
- x Train students thoroughly in methods of analysis, computational mathematics, and statistics;
- x 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;
- x Teach students to use current mathematical concepts and data analysis techniques for problem solving;
- x Have students utilize current mathematical and statistical software;
- x Develop oral and written communication skills.

Upon completion of the program students will have:

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

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

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/gradcatalog

Financial Assistance

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

Graduate Assistantships

- o <u>www.iup.edu/ admissions/ graduate/ financialaid/ assistantships-and-scholarships/</u>
- o Office of Financial Aid: www.iup.edu/financialaid/

Academic Advisement

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

Campus Resources & Student Support

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

Graduate Catalog: www.iup.edu/gradcatalog
Office of the Bursar: www.iup.edu/registrar/

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

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

IUP Campus Library www.iup.edu/ library/ MyIUP: www.iup.edu/myiup/ 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) [MS-Applied Mathematics, Department

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 Graduate Catalog: www.iup.edu/gradcatalog

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 Dissertation and/or Thesis

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

Effective fall 2017 for students admitted and students admitted after -- 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/gradcatalog

University Policies and Procedures

University policy is the baseline policy. Programs may have policy that is more stringent than the University baseline policy; however, not less stringent than the University 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/

The following University and SGSR policies can be found at www.iup.edu/gradcatalog

Academic Good Standing

IUP master's students must maintain a minimum of 3.0 ("B") cumulative graduate quality point average to be in good standing academically. A student must be in good standing to be admitted to degree candidacy and to graduate.

www.iup.edu/ gradcatalog

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:

- x Collaborative discussions are encouraged, but do not sit down with another person and write out the solution to a problem or coding assignment together.
- x 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.

www.iup.edu/ gradcatalog

The Source: A Student Policy Guide: www.iup.edu/ studentconduct/ thesource/

Bereavement-Related Class Absences

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

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.

www.iup.edu/ gradcatalog

Grade 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 violations(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.

www.iup.edu/ gradcatalog

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.

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

Annual Department Events: The department hosts picnics and annual research presentation days. Students are welcomed and encouraged to attend departmental events.

Departmental Clubs: All students are welcome to participate with the Math Club or the Actuarial Club. You can also start your own dub!

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.

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.

- x Society for Industrial and Applied Mathematics: www.siam.org
- x As the department has the membership, students are encouraged to sign up for a free SIAM membership: http://www.siam.org/students/memberships.php
- x American Mathematical Society: www.ams.org

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