

PACM
Student
Handbook

2015

This Handbook is designed to help students fulfill their responsibilities and to make steady progress toward completion of a Master's of Science Degree in Professional Applied and Computational Mathematics (PACM) at SUNY Buffalo State. These requirements and procedures have been established by the Graduate Faculty of the PACM program, acting within guidelines set by the Graduate School. Students should consult the Graduate Catalog in effect when they entered the graduate program for other policies that may be applicable. Graduate degree programs are characterized by the high level of initiative that is expected of graduate students in meeting program requirements, setting up meetings with their committees, or completing their research. Your faculty mentor or committee members should not be expected to remind you of approaching deadlines or requirements.

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Overview of the M.S. in PACM Degree

The M.S. in PACM degree is designed for those who desire advanced knowledge of applied and computational math and statistics. It prepares students for research, professional employment, and/or study at the Ph.D. level.

Graduation Requirements:

- 18 credits ACM courses
- 9 credits PSM (PLUS) courses
- 3 credits internship or project, including written and oral reports
- C or better grade in all required courses
- Overall cumulative GPA of 3.0 or higher

Internship and PLUS courses

The M.S. PSM combines coursework in mathematical modeling, statistical analysis, and computational tools with PLUS courses (e.g., project management and business/technical communication) and an internship experience. The purpose of the internship is threefold: 1) it allows the student to apply knowledge gained in their program to real-world problems in a professional setting; 2) it acquaints the student with the specialized resources of various external organizations; and 3) it assists the student in understanding the nature of employment activities in offices/agencies that employ professional mathematicians.

Course Offerings

Required ACM Courses:

- ACM 600 Foundations of Applied Mathematics Part I (1 credit): Spring annually
- ACM 601 Foundations of Applied Mathematics Part II (1 credit): Spring annually
- ACM 602 Foundations of Applied Mathematics Part III (1 credit): Spring annually
- ACM 610 Continuous Foundations of Applied Math From a Problem Solving Perspective (1 credit): Fall annually or ACM 613 Topics in Spreadsheets and Databases from a Problem Solving Perspective (1 credit): Fall annually
- ACM 611 Discrete Foundations of Applied Math From a Problem Solving Perspective (1 credit): Fall annually or ACM 614 Topics in Statistical Software From a Problem Solving Perspective (1 credit): Fall annually
- ACM 612 Topics in Computational Foundations of Applied Mathematics From a Problem Solving Perspective (1 credit): Fall annually
- ACM 620 Optimization of Discrete Models (1 credit) or ACM 630 Numerical Linear Algebra (1 credit): Fall every two years
- ACM 621 Empirical Model Building (1 credit) or ACM 631 Eigenvalue Problems (1 credit): Fall every two years
- ACM 622 Modeling Change with Dynamical Systems (1 credit) or ACM 632 Numerical Calculus (1 credit): Fall every two years
- ACM 640 Regression and Correlation (1 credit): Spring annually

- ACM 641 Design and Analysis of Experiments (1 credit): Spring annually
- ACM 642 Nonparametric Tests (1 credit): Spring annually
- ACM 650 Random Walks and Brownian Motion (1 credit): Fall every two years
- ACM 651 Markov Chains (1 credit): Fall every two years
- ACM 652 Continuous-time Stochastic Processes (1 credit): Fall every two years
- ACM 660 Logistic Regression (1 credit): Fall annually
- ACM 661 Survival Analysis (1 credit): Fall annually
- ACM 662 Time Series Analysis (1 credit): Fall annually
- ACM 690 Master’s Internship or Project (3 credits): once per program

Required PSM Courses:

- PSM 601 Project Management for Math and Science Professionals (3 credits): Fall every two years, online
- PSM 602 Communication Strategies for Math and Science Professionals (3 credits): Spring annually
- PSM 603 Topics in Professional Math and Science (3 credits): Fall every two years

Electives (Optional Courses):

- ACM 604 Topics in Statistical Inference (1 credit): Fall annually (This course is one way for students to fulfill the statistic prerequisite of MAT 382. Students who are accepted conditionally based on a GPA less than 3.0 should not take this course, but rather, take a full course offering of MAT 382, or equivalent.)
- ACM 653 Markov Chain Models in Credit Risk Management (1 credit): Spring annually
- ACM 654 Mathematics of Finance I: Modeling, Analysis and Numerical Methods (1 credit): As requested
- ACM 655 Mathematics of Finance II: Modeling, Analysis and Numerical Methods (1 credit): As requested

Sample Course Rotation:

Semester (Fall)	ACM 61X (3 1-credit courses) ACM 62X or 63X (3 1-credit courses) OR ACM 65X (3 1-credit courses) PSM 60X (3 credits)
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Begin looking for internship opportunities
Attend extracurricular activities, as offered
Attend monthly student meetings

Semester (Spring)	ACM 60X (3 1-credit courses) ACM 64X (3 1-credit courses) ACM 65X (1-credit elective) PSM 60X (3 credits)
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Apply for internship opportunities
Attend extracurricular activities, as offered

	Attend monthly student meetings
Semester (Summer)	ACM 690 (3 credits)
Semester (Fall)	ACM 62X or 63X (3 1-credit courses) OR ACM 65X (3 1-credit courses) ACM 66X (3 1-credit courses) PSM 60X (3 credits)
	Complete internship deliverables, including written report and oral presentation Attend extracurricular activities, as offered Attend monthly student meetings Apply for graduation

Internships

Arranging the Internship

Students are expected to take ACM 690 (Internship) during their program, upon completion of at least one of the PLUS courses (e.g., PSM 601, PSM 602). The faculty and Program Coordinator will assist in the coordination of the student's internship, but it is ultimately the student's responsibility to obtain an internship position. Members of the Advisory Board will meet on campus each semester and students will be invited to advisory board meeting at the end of each semester; these meetings are excellent networking opportunities and students are strongly encouraged to attend each meeting. Students should also look for internships using the Buffalo State Career Development Center (CDC) Online Resource for Career Advancement (ORCA) service, as well as the PACM website: <http://pacm.buffalostate.edu/>.

An Internship Learning Agreement (ILA) must be completed **prior** to starting an internship. The ILA outlines the duties that must be completed during the internship and it is completed by the student, the Internship Site Supervisor, and the Faculty Internship Advisor. Before the Faculty Internship Advisor will approve registration for ACM 690 (Internship) the ILA must be completed by the Internship Site Supervisor, Faculty Internship Advisor, and the student.

Once the ILA is complete, the student should register for ACM 690. Registration may occur in any semester during the student's program, but no later than the last semester. To register for the course, the student should obtain the Individual Graduate Study Application form from the mathematics department secretary. The student should complete parts A and B of the form, indicating this is a "Graduate Project," attach a brief written description of the project, obtain the appropriate signatures, and forward the form to the registrar.

Completing the Internship

A student must complete 135 hours of work at the internship agency to earn the required three credits for ACM 690 (Internship). The student's grade will be based upon the successful completion of the internship duties listed in ILA; a daily journal/log kept by the student; the research project paper using the report guidelines; the student's self-evaluation form; the Site Supervisor's evaluation form; and an oral presentation to the program advisory board. A copy of all forms and documentation should be submitted to the Program Coordinator and placed in the student's file. A copy of the internship report should be housed in the appropriate online directory by the Faculty Internship Advisor. The grade for ACM 690 will be entered by the Faculty Internship Advisor upon completion of all internship deliverables noted above.

Experiential Learning

In addition to the internship, students are expected to participate in experiential learning to prepare themselves for lives of meaningful work and service. By engaging students in opportunities that integrate knowledge and experience, the experiential learning fosters an understanding and life-long appreciation for learning. Students engage in a process that includes preparation, action, and reflection to develop the habits of mind required to learn effectively from experience and the commitment to put knowledge into action as responsible global citizens.

Students may complete this requirement by being an intern, conducting independent research, taking part in a service-learning project, holding a leadership position, attending seminars, attending site tours, attending conferences, and presenting research. For more information on each option, talk to your academic advisor.

Student Advisement

Arranging a course of study and/or designing a research project are complex tasks which the student carries out with the aid of a faculty adviser or committee. Upon acceptance into the PACM program, each student is assigned a faculty advisor. It is the responsibility of the advisor to establish regular contact with the advisee. Students should meet with their advisor before each registration period to ensure the student is progressing according to plan.

Admission to Candidacy

Candidacy is a written agreement, arrived at between the student and his or her advisor, stating the coursework that the student must complete in order to be awarded their graduate degree. This formal agreement is drawn up with the help of a student's advisor and must be approved by the advisor, Department Chairperson, and the Graduate School Dean. Careful consideration should be given to the development of the agreement since failure to complete the approved coursework may hinder graduation. Once the candidacy form has been approved, changes can be made only with approval of the student's adviser, Department Chairperson, and the Graduate School Dean. Forms for this purpose are available through the Graduate School.

To enter candidacy, the student must satisfy the following requirements:

- Complete at least 6 but not more than 12 credit hours of graduate coursework.
- Maintain at least a "B" (3.0) grade point average on all graduate work.
- Remove all academic deficiencies identified in writing by the Graduate Committee or Chairperson as a condition of admittance to the Graduate Program.
- Remove all grades of I, N, and X.
- Complete the appropriate APPLICATION FOR ADMISSION TO CANDIDACY form.

It is important to be admitted to candidacy before completing 12 credit hours of graduate coursework, since further delay may cause problems with subsequent registration for courses.

Professionalism

PACM is a "Professional" Science Master's program, and we expect professionalism from our faculty, staff, and students alike. This includes interactions on campus and off campus. Professionalism is following through on each commitment and organizational role in a way that exceeds the expectations of others. It is being positive, action-oriented, opened-minded, poised, adaptable, respectful, self-regulated, empathic, organized, prepared, and collaborative. The professionals perform effectively in teams and communicate effectively to individuals and groups through various means. They have special expertise and contribute to a range of challenging disciplinary areas. Life-long learning and self-growth are valued, practiced, and mentored in others. They take care with appearance, language, and productive behaviors to create an image of success. The professionals encourage and support environments that produce trust by demonstrating integrity through ethical and inclusive decision making.

Professionals are:

- Accountable:** By taking full responsibility before, during, and after each effort or decision; they share credit for positive results with others, and readily accept consequences when things don't go as expected.
- Reliable:** Because they can be counted on doing what they say within the quality, allocated time, and committed resources and at the same they are ready to help others when they are in need.
- Self-assessors:** who set criteria for each performance, make key observations; reflect and analyze on these observations, behaviors and actions; and consistently make improvements without being prompted by others.
- Self-aware:** By understanding the implications of their behaviors and actions on others and adapt appropriately for each changing situation.
- Self-motivators:** Who are energetic, passionate and invested by living their daily values
- Risk-takers:** Who achieve success by taking risks that others may be considered to be unpopular and are willing to deal with temporary failure and push-back so long as it is in the best interest of the project or activity.
- Experts:** Who actively advance disciplinary and interdisciplinary knowledge with every learning opportunity to remain current on relevant innovations, methodologies, and practices in their own and related areas of expertise.
- Communicators:** Who effectively express informally and formally through a range of modes and refined interpersonal skills their expertise, expectations, and means to both large groups and individuals.
- Ethical:** By placing a high and consistent focus on aligning decisions and actions with quality individual, disciplinary and organizational values.
- Presentable:** By representing themselves in a manner that is above reproach at all times in their appropriate dress, language, and behaviors.

Graduation

Satisfactory Degree Progress

Satisfactory progress toward completion of your degree requires you to maintain a cumulative GPA of >3.0 (B) on a 4-point scale, earning no grade < C for any graduate course, as well as the items outlined above for both the M.A. and M.S. degrees. Should a student fall below a 3.0 in their coursework, they will have 1 semester (if full time) or until 9 credits are completed if part-time, to bring their cumulative GPA up to a 3.0. Students must also obtain at least a 3.0 in every semester in which they are attempting to bring their cumulative GPA up to the required 3.0. Failure to obtain at least a 3.0 in each semester or failure to reach the cumulative 3.0 in one semester (or 9 credits if part-time) will be grounds for dismissal.

Checklist of M.S. Graduation Requirements

- Completion of 30 credits of graduate work, but no more than 36 credits, with a cumulative GPA of ≥ 3.0 .
- Identification of internship site location and supervisor.
- Completion of ILA followed by completion of internship duties and hours.
- Completion of internship research paper, self-evaluation, site supervisor evaluation, and submission of these items to Program Coordinator.
- Completion of Graduation Application by Graduate School deadline:
<http://graduateschool.buffalostate.edu/forms>

The Lighter Side

Graduate school is an important stepping stone in your career and a time of great academic learning and freedom. You will undertake a wide variety of specialized courses, read many research papers, and possibly undertake a research project and/or internship that is entirely your own. You should value the time that you think long and hard about specific questions and ponder how best to investigate them. You will be challenged in many new ways and will hopefully develop a surprising level of commitment and pride in your academic accomplishments. You will join a group of graduate students who are motivated by similar questions and experiences and who also 'thirst' for knowledge on their topic. Hopefully, that similarity in purpose leads to further scientific interaction as you practice seminars, discuss papers, take classes, or work together. Your time invested during this important stage in your life will help build your peer family here at Buffalo State, and help guide your future decisions. Although the PACM program expects high quality learning and research from its students, you should also have fun while you are here. Upon completion you will enter the ranks of valued graduate alumni, so please keep us informed of your success. Good Luck!