

PACM
Faculty
Handbook

2015

This Handbook is designed to help faculty fulfill their responsibilities and to make steady progress toward the enhancement of a Master's of Science Degree program in Professional Applied and Computational Mathematics (PACM) at Buffalo State College. These requirements and procedures have been established by the Graduate Faculty of the PACM program, acting within guidelines set by the Graduate School.

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Professional Science Master's (PSM) Overview

The Professional Applied and Computational Mathematics (PACM) is an innovative Professional Science Master's (PSM) degree program at Buffalo State College (BSC). This program, a collaboration between BSC and a group of partners from Buffalo and the Western New York area, brings together a diverse interdisciplinary group of active faculty from academia and adjunct faculty and advisory board members from business, industry, non-profit organizations and government agencies.

The goal of the Professional Applied and Computational Mathematics (PACM) is to train graduate students for careers in many emerging fields that now demand a new type of workforce with solid and in-depth background in applied and computational mathematics, as well as with effective business and communication skills.

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

Course Offerings

Required ACM Courses:

3 credits in the following, offered each spring:

- ACM 600 Foundations of Applied Mathematics Part I (1 credit)
- ACM 601 Foundations of Applied Mathematics Part II (1 credit)
- ACM 602 Foundations of Applied Mathematics Part III (1 credit)

3 credits in the following, offered each fall:

- ACM 610 Continuous Foundations of Applied Math From a Problem Solving Perspective (1 credit)
- ACM 611 Discrete Foundations of Applied Math From a Problem Solving Perspective (1 credit)
- ACM 612 Topics in Computational Foundations of Applied Mathematics From a Problem Solving Perspective (1 credit)
- ACM 613 Topics in Spreadsheets and Databases from a Problem Solving Perspective (1 credit)
- ACM 614 Topics in Statistical Software From a Problem Solving Perspective (1 credit)

3 credits in the following, offered fall every two years:

- ACM 620 Optimization of Discrete Models (1 credit)
- ACM 621 Empirical Model Building (1 credit)
- ACM 622 Modeling Change with Dynamical Systems (1 credit)
- ACM 630 Numerical Linear Algebra (1 credit)
- ACM 631 Eigenvalue Problems (1 credit)
- ACM 632 Numerical Calculus (1 credit)

9 credits in the following, offered as indicated:

- 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

1 – 3 credits in the following:

- 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 Professional Math and Science (3 credits): Fall every two years

Electives (Optional Courses):

- 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

Roles and Responsibilities of Faculty

Following are the roles and responsibilities, as laid out by the faculty. Note that due to the small faculty base, collaboration and cross-over of some responsibilities may be necessary. This is meant to act as a guideline for those involved in the PACM program.

PACM Coordinator

Marketing:

- Promotional materials
- Advertising program
- Website
- Social media

Recruitment:

- Target potential students
- Field incoming inquiries

Student Facilitation:

- Communication and coordination
- Registration
- Graduation
- Tracking and record-keeping
- Reporting to CDC, NPSMA, as required

Jobs/Internship:

- Communication of potential opportunities
- Communication of workshops
- House paperwork

Assessment:

- Annual survey to alumni

Advisory board:

- Coordinate advisory board meetings

Alumni:

- Maintain contact information

Documentation:

- Document standard operating procedures
- Update documents, as needed

PACM Chair

Orientation:

- Develop annual orientation for students

Professional outreach:

- Assist students in internship and job placement
- Arrange seminars with professionals from industry
- Network and develop internship opportunities

Advisory board:

- Network and develop solid relationships with prospective board members
- Revise advisory board, as needed
- Determine how to use advisory board
- Provide quarterly updates of program status

PACM S&O Committee

Admissions:

- Admissions criteria review for overall program
- Review applicants and enter decisions
- If prerequisites not met, develop way for students to make up deficiencies

Advisement:

- Advise students in program
- Advise internships

Curriculum:

- Review and update curriculum, as necessary

Funding:

- Assess and develop funding opportunities

Assessment:

- Student assessment by cohort
- Program assessment, compared to other PSMs

PACM Faculty Advisement

At acceptance, each student is assigned a faculty advisor. 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. 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.

Internships

All students must complete at least one 3-credit internship during the course of the program. Students may complete additional internships, but are not required to register or complete all of the deliverables for any additional internships. Internship information and forms can be found on the PACM website: <http://pacm.buffalostate.edu/about-program/internship-resources-0>.

Searching for internships:

- Students should search potential internship locations that are related to their industry of interest. They may search local company websites and job posting, use links from other schools such as <http://www.mtsu.edu/biology/internships.shtml>, talk with faculty regarding interests and possible connections, and talk to BSC Career Development Center (CDC) in Cleveland 306 and search CDC website for openings.
- Faculty should use current business partner relationships, or any external relationships, to help secure an internship position for the student.
- It is in the student's best interest to search for and obtain an internship independently, since this is practice for an actual job search.

Application:

- Most internships will require a formal application via their Human Resources department.
- Application may involve development of the following:
 - Cover letter,
 - Resume,
 - Research to gain advance knowledge of the company or internship site, and
 - Interview.

Learning agreement:

- A learning agreement is an arrangement between Buffalo State College and the internship site to identify the learning activities that will be part of the internship.
- Once a student has been hired for an internship, the student should choose a faculty internship advisor within the PACM faculty. That faculty member should guide the student in completion of all deliverables, including the Internal Learning Agreement (ILA).
- An ILA must be completed **prior** to course registration and commencement of the internship. It should be signed by the internship site supervisor, the intern, and the faculty internship supervisor.
- A copy of the ILA should be provided to the PACM Coordinator. The intern should also retain a copy for their records.

Credit:

- Because Buffalo State awards the credit, it is important that the learning experience meet New York State Education Department and SUNY guidelines for both time and achievement of learning objectives.

- Time: Minimum internship hours must be 45 hours (15 50-minute instructional hours and 30 supplementary hours) or greater per each credit hour.
- Learning Objective: The quality of learning must be at the college level and must include specific learning outcomes. Learning objectives should reflect institutional goals, as well as more discipline-specific goals at the applied math level.
- All systems or formulae for awarding credit must comply with University policies and state regulations.
- Ultimately, faculty are responsible for evaluating the extent to which student activities achieve the curricular goals of the program.
- For any internship that is only credit-bearing and is unpaid, the department should consult with the Career Development Center on insurance guidelines, as the intern will not be covered for any liabilities at the worksite, including loss of data, injury, etc. This could be a serious issue should a situation arise, thus it is best that any off-site internship be paid.

Implementation:

Supervision:

- Internships require a combined supervisory effort between Buffalo State College and the internship site. Appropriate full-time faculty from the Mathematics department should provide internship supervision.
- An appropriately qualified individual from the internship site will supervise the student and will remain in consultation with the faculty member. The internship supervisor will provide appropriate training and mentoring.

Communication:

- The faculty advisor and the student intern should maintain regular contact regarding student progress during the entire course of the internship. Contact may be established via e-mail, telephone, advisor/advisee meetings, site visits, and hard copy documentation.
- Recommendations include:
 - Weekly reciprocal communication,
 - At least one site visit, and
 - Seminars or classroom meeting with other interns in the PACM program.

Written reports:

- Regular written and electronic communication should be established to ensure that desired learning outcomes can be or are being maintained as the internship progresses.
- The student is responsible for creation of a final internship report, based on the report guidelines, to be provided to the faculty internship advisor by the faculty's designated due date.
- Once approved, the faculty internship advisor should upload an electronic copy of the internship report to the appropriate database.

Oral reports:

- The student is responsible for giving an oral (or poster) presentation to the advisory board at the annual/bi-annual advisory board meeting. The student should work with their faculty internship advisor on the format of the presentation.

Evaluation forms:

- At the end of the internship, the student must submit an evaluation of the internship experience.
- The site supervisor should submit a final assessment of the intern's performance at the conclusion of the internship, and prior to the grade being submitted.
- The results of the assessments should be distributed to all appropriate constituents.
- Hard copies of these forms should be provided to the PACM Coordinator for the student's file.

Grading:

- The faculty member is responsible for evaluating student work and determining the grade. Student grades should be based on satisfactory completion of the requirements (completion of work, ILA, two assessments, written report, and oral report) and assignments and the degree to which the learning objectives stated in the learning agreement have been achieved.
- Faculty may wish to have students give a 20 minutes presentation to faculty, students, and advisory board members at the beginning of the bi-annual advisory board meeting.
- The student should submit regular written or reports during the internship that reveal the overall value of the internship experience.

Admissions and Acceptance

Students apply to the PACM program directly through the Graduate School. Once the application is complete, the Admissions Coordinator from the Graduate School will contact the PACM Coordinator via email indicating that there is a complete application for the program. The shared drive (\\bscappm1\gradadmissions) will be fully set and the application has been added to your folder. Within the folder, there are sub folders called "accept" and "deny" and any outstanding applications. The decision sheet is also attached to the email.

The PACM Coordinator is responsible for setting up a ½ hour interview with the applicant and available PACM faculty to review the candidate's application and to discuss the program requirements. The PACM Coordinator. All PACM faculty have access to the shared drive (indicted above). Each faculty member should review the application and provide feedback either before or during the interview.

Once a decision has been made, if accepted, the PACM Coordinator will send a decision letter to the applicant indicating acceptance, assigned advisor, and any requirements that must be met. The PACM Coordinator will also complete and send the decision sheet back to the Admissions Coordinator electronically, by fax (5630), or by inter-office mail, with the decision letter attached. If the applicant is

not accepted into the program, the decision sheet should still be completed and send back to the Admissions Coordinator; however, the Graduate School will handle the rejection letter.

Decision Criteria

Denied Admission:

If an applicant is determined to not be a successful candidate for the program, the PACM faculty should decline acceptance into the program. In this case, the PACM Coordinator will complete the decision sheet and submit it to the Graduate Office. The Coordinator should not contact the applicant directly, but rather, allow the decline to be communication via Graduate Admissions.

Acceptance:

If an applicant is accepted into the program, the PACM Coordinator should send an acceptance letter to the applicant, complete the decision sheet, and forward the decision sheet, along with a copy of the acceptance letter, to Graduate Admissions.

Conditional Acceptance:

An applicant can be accepted into the program conditionally if the applicant meets the Graduate School Policy 2.5 GPA requirement, but does not necessary meet all of the PACM requirements. Conditional acceptance is at the discretion of the PACM faculty. If conditionally accepted, the Coordinator should follow the same procedure as acceptance, while indicated the reasons for conditional acceptance on both the decision sheet and the acceptance letter. Meeting the requirements for full acceptance is the responsibility of the applicant and monitoring the progress is the responsibility of the PACM faculty. The Graduate School will consider a conditionally accepted student the same as an accepted student. Conditional acceptance has no negative impact on financial aid.

Accepted to Premajor:

If a student does not meet the Graduate School Policy 2.5 GPA requirement, an applicant may only be accepted to the premajor. The student must maintain a GPA of 3.0 in their first semester of graduate studies and then reapply to the program at the end of the first semester to be admitted into the program. If accepted to the premajor, the Coordinator should follow the same procedure as acceptance, while indicated the reasons for acceptance to the premajor on the acceptance letter. Meeting the requirements for full acceptance and reapplying to the program is the responsibility of the applicant. Acceptance to the premajor has a negative impact on financial aid.

Graduation

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.

Degree Conferral

Prior to each conferral date, the Graduation Coordinator within the Graduate School will send a list of students who have applied for Graduation to the PACM Coordinator. The PACM Coordinator will assess the completion of each student's record and approve/not approve each application. Each faculty advisor should work with the PACM Coordinator to provide information related to any deficiencies on a student's record.

Advisory board/professional outreach

It is the responsibility of the PACM Chair to provide continual professional outreach to local industries; however, outreach by all PACM faculty is strongly encouraged to keep the program relevant and vital. At a minimum, board members should be brought onto campus at the end of each semester for an advisory board meeting. It is recommended that additional contact be maintained with the core members throughout the school year as well. Events such as recruitment fairs, adjunct teaching, guest lecturing, presentations, and facility tours should be coordinated by the PACM Chair to provide students with an opportunity to apply concepts and view real-world industries.

At the end of each semester, the PACM Coordinator should coordinate an advisory board meeting, including industry partners, PACM faculty, on-campus relevant faculty, deans, and students. The meeting may last 2-3 hours and will include such agenda items as student internship presentations (oral, posters), PSM updates, program updates, and feedback. An invitation for the meeting should be sent out at least a month in advance to allow industry members to adjust their calendars. A reminder should be sent out closer to the date of the meeting.

Coordination of the meeting includes:

1. Determining which students will present and in what format,
2. Securing a room,

3. Creating and distributing an agenda,
4. Sending out a meeting request to all invitees,
5. Requesting funds for food and beverages from the dean,
6. Ordering food and beverages, and picking up the day of the event, including paper products,
7. Securing easels, if needed, and picking up easels the day of the event,
8. Picking up the room key the day of the event,
9. Ensuring all audio visual is available and working,
10. Setting up the room the day of the event,
11. Securing parking passes from campus security and distributing to those who may need them,
12. Breaking down the room at the end of the event,
13. Returning all easels and the key after the event.

Marketing and recruitment

The Graduate School provides several opportunities to promote the PACM program at graduate fairs on campus. The PACM Coordinator, or a designated representative, should attend each of these fairs with promotional materials and business cards.

Promotional media is maintained by the PACM Coordinator, and is created through College Relations or Industrial Resources. Note that there is a cost associated with changes and printing materials, thus these should only be updated as needed.

The PACM program website (<http://pacm.buffalostate.edu/>) should be updated regularly by the PACM Coordinator or Graduate Assistant. This is the main tool for existing students and potential applicants, so it is critical that the information is up to date and relevant. Any faculty that would like administrative access should contact College Relations.

The chair should reach out to other mathematics chairs at regional schools via a recruitment letter on an annual basis. This letter should be an invitation to post our PACM media for potential applicants to view.

A Facebook page titled Professional Applied and Computational Mathematics MS at BSC (https://www.facebook.com/pages/Professional-Applied-and-Computational-Mathematics-MS-at-BSC/171498616232062?ref=aymt_homepage_panel) is maintained by the PACM Coordinator.

Assessment

An assessment plan was developed by the PACM faculty in summer 2013. As of this date, a plan for implementation has yet to be established. It is best practice to assess part or all of the program on an annual basis.

As part of assessment, the PACM Coordinator distributes an annual survey to alumni to gather information on the index of value of the program to employers. This information is shared with

students, faculty and industry and is used as a marketing tool on the PACM website (<http://pacm.buffalostate.edu/careerplacementstatistics>).

Orientation

It is the responsibility of the PACM Chair to coordinate an annual orientation in August prior to the start of the fall semester. This allows all students a chance to bond as a cohort, ensure they are registered for the appropriate classes, and to feel part of the program. This also allows for faculty to communicate expectations for the program and the upcoming academic year.

Curriculum

Curriculum should remain relevant to industry needs, and it is crucial for faculty to stay connected to industry partners and trends. Incorporating real data and hands-on projects from industry is one way to enhance the program and keep curriculum current. New course should also be developed to enhance the curriculum. It is the responsibility of all PACM faculty members to maintain their own courses as needed. Curriculum development should be discussed regularly in the PACM faculty update meetings.

Funding/Grants

Funding and grant opportunities should always be search for and applied for, if applicable. It is the responsibility of all PACM faculty to search for and apply for funding opportunities.

Consulting

It is good practice for faculty to consult in industry to enhance understanding of industry needs; however, as of this date, this practice has not be implemented in the PACM program.