### Math PiLOT Progress Report

April 7, 2008 - Submitted by Sharon O'Hare, Director

#### Math PiLOT



Math PiLOT is one of a number of student retention initiatives undertaken by The University of Montana. Its focus is on improving student performance, placement and persistence in mathematics courses at The University of Montana.

Math PiLOT is funded jointly by the Office of the

Provost, the College of Arts and Sciences, and the Department of Math Sciences. A full-time professional director was hired during the summer of 2007.

#### Project: Introducing Math PiLOT Services

Since Math PiLOT is a new program, it has been important to enthusiastically promote its existence and services to the University community in its first year.

The on-going marketing efforts include customer outreach activities such as:

- Publication of a Math PiLOT brochure "Tired of just winging it in math?", distributing it to all students enrolled in Fall 2007 and Spring 2008 100-level math courses, new faculty, Undergraduate Advising Center, Registrar's Office, and Admissions Office.
- Making "How to Succeed in Mathematics" presentations to specific campus groups (TRIO-SSS students, freshman/transfer student athletes, all MATH100 students.)
- Placing informational slides re: Math PiLOT services and tutoring locations/hours on the plasma-screen rotation cycle at the Mansfield Library and in all of the residence halls.

#### Project: Advising the at-risk math student

Another strategy in the goal to improve student performance has been to provide one-to-one counseling and advising to students who are struggling in a math class. Since the fall of 2007, over 450 students have come to the Math PiLOT office seeking a variety of advising services. Many are non-traditional students and students with disabilities. Counseling interventions have included: informing students of Math PiLOT services and tutoring; administering gateway exams to students who missed the in-class assessment; recommending resources for brushing up on math skills; and helping students add or drop a math course. Students seek advising on their own, or are referred by faculty, departmental and professional advisors, or fellow students.

#### Project: Opening math@MANSFIELD, expanding the Math Learning Center

Perhaps the most visible accomplishment to date has been the expansion of the math tutoring program for 100-level math courses. In the fall of 2007, Math PiLOT opened a second math tutoring location in Mansfield Library and moved all of our developmental math and non-calculus track tutoring there. The location in the library has enabled us to provide tutoring as late as 9:00pm and on the weekend.

Opening a second tutoring center in the library has also allowed us to repurpose the existing Math Learning Center in the Math Building as a tutoring location for the calculus-bound student. Instructors for precalculus and calculus frequently use the space to hold open office hours and conduct test reviews.

The two centers served a combined total of nearly 2,300 students this past fall; spring semester usage is expected to exceed 2,500.

Tutoring Site	Location	For Help With		
math@MANSFIELD Sunday: 5-9pm Mon-Thurs: 1-9pm	Mansfield Library (south of the UC Bookstore, Mountain Campus) Level 2, MLIB Rm 211	Pre-AlgebraMAT002Intro. AlgebraMAT005Intermed. AlgebraMATH100MAT100MAT1100Contemp. MathMATH107Numbers as NewsMATH109Prob. & Lin. MathMATH117Math for Elem. TeachersMATH130/131		
Mathematics Learning Center Mon-Thurs: 1-7pm	Math Building (on the Oval, adjacent to underground lecture halls) Rm 011 – Basement	Precalculus MAT/MATH121 Applied Calculus Calculus I MATH152 Calculus II MATH153		

#### Project: Assessing Student Readiness through Gateway Exams

Math PiLOT administered first-week Gateway Exam (GW) testing in selected 100level math courses in the fall semester. At the end of the first week of classes, 1,183 GW Exams were given to students in MATH100, MATH117, MATH130, and MATH121 courses, as well as three sections of MATH 152 (calculus). The exams were written by the course coordinators, often in consultation with fellow instructors, and graded by the instructors and tutors. Exams were returned to the students the next day of class, with advice on how to interpret their score. Students who scored in the bottom 30% were strongly encouraged to talk to their instructor and/or come to the Math PiLOT office for help in deciding if they should remain in the course. Fall 07 Findings: Based on an analysis of students' GW Exam scores and their subsequent performance in the course, we found that students were reluctant to heed the warning a very low GW Exam score implied, and chose to remain in the course. There was not a strong correlation between GW Exam score and final grade.

Spring 08 Actions: The GW exams were revised for the spring semester, and GW exam participation was expanded to include all sections of MATH100, 107,117, 121 and 130. Another analysis will be conducted following final grade postings to determine if students were more likely to heed a low exam score "warning", and to again assess correlation between a low GW score and course grade.

#### Project: Ongoing Data Collection and Analysis

Analyzing data from the fall Early Alert Initiative

 This past fall the Office of the Provost initiated Early Alert grading for students whose early performance in a 100- or 200-level course is unsatisfactory. Instructors were requested to post a DEF grade (DEF signifies "deficient") at the end of the third week for students with a D or F average. The analysis, conducted for all course sections (not just mathematics) that participated in Early Alert, revealed - not surprisingly - that there is a strong correlation between receiving a DEF grade and failing to successfully complete the course. The analysis also suggests that a student's ability to overcome a DEF grade may well depend on the nature of the course itself.

#### Analyzing student performance in mathematics courses

From the outset, one of the goals of the Math PiLOT program has been to implement systematic assessment and monitoring of student performance in math courses at the University of Montana. An analysis of student performance in the fall 2007 semester is complete; a similar analysis for the spring semester will be conducted as well. As we acquire semesters of data on student performance, we can examine the results for long-term trends and impacts associated with curricular revisions.

#### Project: Collaborating and Assisting with CAS/Dept. of Math Sciences Initiatives

Communicating changes in the math curriculum to the University community

 On September 25<sup>th</sup>, the Department of Mathematical Sciences faculty approved substantive revisions to the 100-level mathematics curriculum, adding two new courses, and revising the pre-requisite sequencing. Math PiLOT has assisted in this effort by creating informational products and brochures to help communicate these changes, including the following graphic:



 As director of Math PiLOT, I have made a number of presentations to members of the University community in order to explain the scope of the changes in math and how these changes will impact students. The groups have included the senate of the Associated Students of the University of Montana, the Retention Task Force, Peer Advisers, and the professional advising staff.

Consulting with departmental clients re: the MATH 117 curriculum

During the fall semester, Jon Tompkins, Associate Dean of CAS and I assembled a small working group from the Department of Mathematical Sciences in order to assess whether the current MATH 117 curriculum was best meeting the needs of the School of Business and other departmental "end-users" of the course. The consensus view of representatives from SOBA and the departments of Psychology, Sociology, Communication Studies and Economics was that their students did not need an in-depth study of linear programming and its various solution techniques. The consensus view was that instructional time could be more productively spent on topics associated with quantitative literacy and linear modeling. Working with Lauren Fern, course coordinator for MATH117, and Dr. Libby Knott, professor of mathematics, a revised MATH117 curriculum n place by the spring semester.

Serving on the Math Placement Testing committee

 The Office of the Provost formed an interdepartmental committee to select a math assessment instrument that all incoming freshmen would be required to take prior to registering for mathematics courses at The University. As of this writing, the committee is finalizing its selections, with Summer 2008 as the tentative implementation date.

I could use some help!
Name
e-mail
phone
You can send a text message to me at this number: Yes or No

Class (circle one):	FR	SO	JR	SR
Last math course				
Year	_Grade_			

#### I need a Math Skills Refresher Workshop on:

□ The One-Minute Line Graph

Forgotten Algebra

□ Getting to Know My Calculator

 $\hfill\square$  Other topics:

Detach this portion of the brochure & drop it off at the Math Department main office, or mail it to:

Math PiLOT The University of Montana Dept. of Mathematical Sciences Missoula, MT 59812-0864

Or call 243-5672 to make an appointment.



## Math Pilot

is sponsored by the Office of the Provost,

College of

Arts and Sciences,

and Department of

Mathematical Sciences.

Sharon O'Hare, Director David Patterson, Chair Appendix A-3



# The Programs

#### Math PiLOT Counseling & Placement

Are you someone who identifies with the phrase "math phobic"? Does the thought of solving for "X" make you lightheaded? Or do you just need help selecting the right math course? Call the Math PiLOT Program Office at 243-5672, or email Math PiLOT Program at mathpilot@mso.umt.edu to make an appointment. We're friendly and we listen.

#### The Math Learning Center

Located in the basement of the Math Building, the MLC can be your life line for homework help and test preparation. Staffed by trained undergraduate tutors, the MLC is also a great place for study groups to meet. Just drop in anytime during the hours of operation (posted outside the entrance to the MLC).

#### Math Skills Refresher Workshops

Anyone's math skills can get rusty if they haven't been used recently. Throughout the semester, we offer mini-workshops on skills essential for success in college math. Some of the topics include "The One-Minute Line Graph", "Forgotten Algebra", and the ever-popular "Getting to Know My Graphing Calculator".

#### **Outreach to Math "Abstainers"**

All right, we know you're out there! Yes, we're talking to you juniors and seniors who have been putting off taking that "one last math class". Don't wait any longer – come in and meet with us to develop a realistic plan for completing your mathematics general education requirement. And if this is your last semester, call us TODAY for an appointment.

#### **Early Warning System**

Our Early Warning Philosophy: the earlier we identify a student who is struggling in math, the more options we have to help that student succeed.

Starting in the fall of 2007, many of the 100level courses will administer a "gateway" exam at the end of the first week. This allows instructors to identify those students at risk and refer them to the Math PiLOT voluntary programs, including counseling and placement. The goal of the exam is not to make a student feel "math stupid"! We want to identify those students who could benefit from early help in the semester, or who unknowingly enrolled in the wrong course.



Whether you are a first year student or someone who hasn't been in a math class in a while, there's a Math PiLOT (Partners in Learning On Track) program for you.



"One of the factors that most influences a student's progress toward graduation is successful completion of college math courses." U.S. Department of Education, 2004 For specific questions about math advising, or to refer students for math placement testing and counseling, contact the Math PiLOT Program office.



Sharon O'Hare, Director

Math PiLOT

Rm 111, Math Building

406.243.5672 sohare@mso.umt.edu.



**Note:** Only use this guide for the

Spring 2008 semester. A new guide will

be published for Summer & Fall 2008

semesters, pending Faculty Senate approval of the Math Department

curriculum revision proposal.

Appendix A-4 Getting the Right Track An Advisors Guide to 100-level Math Courses Spring 2008

> Department of Mathematical Sciences The University of Montana



The Department of Mathematical Sciences proposal to revise its 100-level math curriculum creates four distinct tracks. Students select the appropriate track based on the requirements of their majors. Some majors may require their students to take math from more than one track. These tracks are:

> Majors requiring Calculus Elementary Education Business/Social Sciences Liberal Arts/Humanities

We offer the following suggestions to advisors as you help students select the right math course to take in Spring 2008.

#### As a first step, help your advisees identify which one of the four tracks he/she will need to follow.

Most majors that require statistics list MATH117 as the prerequisite for that course. If a major requires a student only to meet the Mathematical Literacy Gen Ed requirement, any of the math courses numbered higher than 100 are sufficient. (Most liberal arts and humanities majors take MATH107, but MATH117 is also an appropriate choice.) What should an advisor tell the student currently enrolled in MAT005, or one who was planning to take MATH100 this coming Spring semester?

Again, for all students course selection should be based on requirements of the major. If a major requires calculus (for example Physics or Chemistry), or if the student plans to major in elementary education, MATH100 should be the choice. However, beginning in Fall of 2008, MATH100 will no longer be a prerequisite for MATH107 or MATH117. Students who must take MATH107 or MATH117 for their major may enroll straight away in one of them, as long as they have a successful high school background in algebra or have passed MAT005 **with a B- or better**.

If you are unable to identify the most appropriate course for a student on a particular track, refer the student to the Math PiLOT office in the Math Department (room 111) for placement information.