Math 2011-12

MTH 096, Using the Scientific Calculator - Upgrade of Instructional Materials

Summary:

This initiative seeks funding for substantial updating and enhancement of MTH 096, Using the Scientific Graphing Calculator. There is no text for this course. There is a notebook of resources which includes sample activities written by individual instructors in the past. What is lacking are specific activities tied to each of 15 topics to be covered that can be readily used by any instructor teaching the course. Creating a set of such activities would provide uniformity and ease of instruction, which would positively impact student learning, retention and progression through transfer level mathematics courses. Funding of this project also supports the college goal of sustainability as creation of the appropriate materials represents an efficiency for instructors that provides best results for students.

Description

MTH 096 is a one-credit, pass/no pass, elective course. The course is designed to assist students in learning the features of the scientific graphing calculator before taking a course that requires this calculator. It is offered midway through each term and meets for 4 hours on 3 consecutive Saturdays in a term. Students taking MTH 095, Intermediate Algebra, are encouraged to enroll in MTH 096. MTH 111, College Algebra, is the main course for which topics in MTH 096 are chosen. The math requirement for the AAOT, ASOT, AS, AGS, and AAS degrees can be met with MTH 111. Students completing an AAOT or ASOT degree, in particular, would likely choose MTH 111 as a final course, unless their program required a higher level math course. About 48 sections of MTH 111 (each with a capacity of 36 students) are offered each year, so there are many students who would benefit from an enhanced MTH 096 course.

Historically, it has been up to the instructor to create the course materials for MTH 096, based on assistance from previous instructors, the course lead instructor, and guidance from the sample syllabus. The time commitment for an instructor to synthesize materials for this one credit course is inefficient. Recently, a notebook of resources has been created for MTH 096 instructors. The issue of lack of uniformity due to various authors of activities still exists. All topics may not be covered and different writing styles may cloud instruction. Having current, relevant, uniform course materials will positively impact preparation, progression, and completion for students taking MTH 111 and higher level courses.

Beyond Crossroads: Implementing Mathematics Standards in the First Two Years of College, a 2006 publication of AMATYC (The American Mathematical Association of Two-year Colleges) states, on page 48, that instructors must…" *create courses and activities to promote students' ability to use multiple approaches or representations to examine mathematical concepts so that students develop a better understanding of connections among topics and improve their ability to work abstractly*."

The technological and visual aspects of the graphing calculator are critical to helping students make connections and reason abstractly.

In 2009-10, the completion rate for MTH 111 was at 93.8% while the success rate was 80.6%. Though there is some training on the graphing calculator provided in MTH 111, a strong MTH 096 course could be instrumental in closing the gap between the completion and success rates in MTH 111. It should also be mentioned that the completion and success rates for MTH 096 could be improved. For 2009-10, both rates were 67.5%.

Quality, uniformity and accessibility of materials are key elements to providing a solid MTH 096 course. Accessibility to both instructors and students is important. We offer only three sections of MTH 096 each year. There is a sense that we might grow this course offering to the benefit of many of our students. Looking to the future, there is interest in making MTH 096 available in either hybrid or online format. The development of these course materials will impact movement forward in this direction. We already offer hybrid sections of MTH 095 and MTH 111, so being poised to offer MTH 096 in other formats is a strategic move.

Questions and Answers

How is the initiative linked to the Unit Plans most recently submitted?

1. **How does it continue the achievement of those goals?**
2. **If this is a continuation of an initiative started last year, make sure that relationship is clear.**

How is this initiative linked to the efficiencies and productivities plans you had last year?

1. **How does it continue the achievement of these plans?**
2. **If this is a continuation of an efficiency or productivity plan started last year, make sure that relationship is clear.**

This initiative is listed as an activity in the recently submitted (Fall 2010) part III of our unit plan.

This initiative is an activity added under the following unit planning goal listed in the 2008, 2009, and 2010 unit plans: "Enhance continuity and consistency within the division through active division committees." In the case of this activity, the goal refers to consistency of instructional materials that result in instruction that meets the learning outcomes of the course. This activity is also an attempt at providing continuity of instruction from one topic and activity to the next. Finally, this update of MTH 096 will be instrumental in increasing enrollment in the course. Strengthening of the course materials will provide students with a more solid introduction to the appropriate use of the graphing calculator in learning mathematics.

Describe the resources needed:

Our request is for 130 hours of curriculum development funding as described below.

Work will involve the following:

1. Review and modify (if needed) the 15 topics now being presented in MTH 096. This will involve collaboration between the current and past MTH 096 course leads, the MTH 111 course lead, and a part time instructor who frequently teaches MTH 096.
2. Create activities for each topic being presented in MTH 096.

Anticipated time commitment:

1. Review and modification of topics: 10 hours
2. Development, proofing and re-writing (if needed) of the activities for each topic: 15 activities x 8 hours per activity = 120 hours. [Note: the number of activities may vary slightly from 15, depending on the modifications of the topics.]

Total Hours Requested: 130

Total Funds Requested: 130*$29.44*1.312 = $5,021.29

What specific measurable program outcomes do you expect to achieve with this initiative? The outcomes should be specific enough to be measurable. Also, outline the method that will be used to determine the results.

*Improved retention and success rates in MTH 096;

*Increased enrollment in MTH 096 by students who enroll for MTH 111; and

*Increased success rates in MTH 111.

These outcomes will be measured with data provided by IRAP

Department Priority:

2

Unit Resources:

Funding Request: Carl Perkins

Is this a Career & Technical Education program approved by the state and offered through Lane for credit?

No

If not a Career & Technical Education program, does your request provide considerable support for students enrolled in these programs?

No

Do you have an advisory committee that meets 2-3 times per year?

Yes

If request is for personnel, will funds be used to replace an existing position?

N/A

How will funding this initiative increase or sustain the academic achievement and technical skills attainment (GPA of 2.0 or better) of Career and Technical Education students?

Career and Technical Education students who are also obtaining an AAOT, ASOT, or AS degree will benefit from the funding through greater understanding of how to use the graphing calculator prior to completing the transfer level math requirement for their degree. Students will have a greater understanding of the problem solving aspects of the graphing calculator, and will be better prepared to progress and complete a course requiring the use of the graphing calculator.

How will funding this initiative increase or sustain the number of CTE students that graduate or receive a one year certificate from Lane and help prepare the students for employment?

CTE students wishing to complete a degree along with their program requirements will benefit from this initiative. Increased retention and success rates in MTH 096 may positively impact completion rates for degrees requiring transfer level mathematics.

Improvements to the course materials will also help ensure that students learn the skills intended. These skills which include being able to make connections and problem solve, are transferable to the work place.

EQUIPMENT $

COMPUTER HARDWARE $

COMPUTER SOFTWARE $

MATERIALS & SUPPLIES $

CURRICULUM DEVELOPMENT (Hours)

130

PART-TIME FACULTY $

TIMESHEET STAFF $

TRAVEL $

Can this initiative be partially funded?

Yes

EQUIPMENT $

(E) Explanation of effect of partial funding:

COMPUTER HARDWARE $

(CH) Explanation of effect of partial funding:

COMPUTER SOFTWARE $

(CS) Explanation of effect of partial funding:

MATERIALS & SUPPLIES $

(MS) Explanation of effect of partial funding:

CURRICULUM DEVELOPMENT (HOURS)

100

(CD) Explanation of effect of partial funding:

This initiative could be reluctantly partially funded. For example, if the number of hours allocated for each activity was reduced from 8 to 6, the total number of hours required would be 100 (10 + 6*15 = 100).

PART-TIME FACULTY $

(PF) Explanation of effect of partial funding:

TIMESHEET STAFF $

(TS) Explanation of effect of partial funding:

TRAVEL $

(T) Explanation of effect of partial funding:

Funding Request: Curriculum Development

1. List the following information

- **Course Numbers (titles if not currently offered)**
- **Instructor Name(s) who will work on the curriculum development**
- **Whether each of the courses is in, or has been through, the curriculum approval process**

*MTH 096

*Gayle Smith, Charlotte Behm, and Steve Selph

*Yes. This is an approved course.

2. List each course number (or title) and the materials to be created for each class

- **Instructional goals, objectives, syllabi and outlines**
- **Lab instruction packets**
- **Practice, quiz, presentation &/or demonstration materials**
- **Other (specify)**

MTH 096:

*Activities for each of about 15 Graphing Calculator topics

3. List each course number (or title) and give your timeline for beginning and completing each course curriculum development.

MTH 096:

Begin June 13, 2011

Complete by December 10, 2011

4. What are up to 3 departmental instructional goals that are met through the development of curriculum in each class?

*Increasing student retention and success;

*Meeting the needs of degree completing students taking transfer level math courses that require the graphing calculator; and

*Providing quality, relevant instructional materials that promote math problem solving skills consistent with AMATYC Standards.

5. List each course number (or title) and give the value of the development of curriculum in each course to other faculty members.

MTH 096:

The activities created will be used by instructors teaching MTH 096. To provide materials that could be easily picked up by an instructor for this one-credit course is a staffing efficiency, particularly if we want to increase the number of sections offered.

The improvement to MTH 096 may positively impact the success of students taking MTH 111 and other courses for which the graphing calculator is required. Instructors of these other courses will see improvement in student calculator skills that will positively impact success in their classes.

6. List each course number (or title) and say how many students will be served by the development of curriculum in each class.

MTH 096:

3 sections of MTH 096 are offered each year with space for 28 in each class for a total of about 99 students.

48 sections of MTH 111 are offered each year with space for 36 in each class for a total of about 1728 students who might benefit from taking MTH 096 before taking MTH 111. There is definitely potential for offering more sections of MTH 096 to accommodate more students prior to their taking MTH 111 and other transfer level courses.

7. List each course number (or title) and give the specific benefits to students that you expect from the development of curriculum in each class.

For MTH 096, and for MTH 111 and the other transfer level math courses for which the graphing calculator is required:

*Increased student retention and success;

*Relevant materials that improve problem solving skills and model appropriate use of the graphing calculator in learning mathematics; and

*Potential for providing access to materials online.

8. List each course number (or title) and give the specific benefits for diversity that you expect from the development of curriculum in each class.

MTH 096:

Consistency of course materials, particularly for an activity-driven course like MTH 096, would have a positive impact on our diverse group of students.

9. List each course number (or title) and give the specific benefits to sustainability that you expect from the development of curriculum in each class.

MTH 096:

*Providing instructors with quality, relevant, succinct materials that can be easily picked up and used by an instructor to teach this one-credit course for optimal student learning.

10. List each course number (or title) and give the specific effects on distributed learning that you expect from the development of curriculum in each class.

MTH 096:

*Providing students with quality activities that they can easily review between MTH 096 course meetings and when they are enrolled in their transfer level math courses requiring the graphing calculator;

*Possibly providing students with online access to the MTH 096 course materials.

Hours requested for Curriculum Development funding:

Please enter the amount of one of the following:

- **100 hours maximum for new development.**
- **70 hours maximum for course revision**
- **50 hours for 3-4 credit conversion**
- **other (use if multiple courses addressed in one initiative**

Do not enter any characters other than numbers and a decimal.

How many hours are you requesting? If there are multiple courses addressed in the initiative, please list each course number (or title) and give the number of hours requested for each course.

100

Can this initiative be partially funded?

Yes

Partially funded curriculum development HOURS requested:

85

Explanation of effect of partial funding:

The actual funding needed for this project is 130 hours. This number represents the need for 10 hours to review and modify topics and 8 hours of work on each of 15 activities. If we reduce the hours from 8 to 6, the required total hours would total 100 . Further reduction of funds would make it difficult to produce quality materials. Reducing hours spent on each activity to 5, would result in 85 total hours needed.

Funding Request: Technology Fee