

Vision - Potential

Vision Within Every Instructor - Potential Within Every Student

Newsletter of the HBCU College Algebra Reform Consortium*

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[1] **PREP Workshop**

“Refocusing and reMODELING
College Algebra”

Over the past decade there has been a national movement to improve and refocus the content taught and the pedagogy used within a College Algebra course. Refocused courses ask students to solve contextually-based problems by creating and interpreting mathematical models. Students make use of appropriate technology to solve problems and assist them in communicating relevant solutions to their real-life problems. The PREP workshop will be held on the campus of the University of Wisconsin – River Falls in River Falls, WI from June 1, 2009 to June 5, 2009. The facilitators for the workshop are:

Don Small, United States Military Academy
Kathryn Ernie, University of Wisconsin at River Falls

* Supported by the U.S. Military Academy.

Erick Hofacker, University of Wisconsin at River Falls

The workshop is designed to assist faculty from mathematics departments who have plans to refocus their current College Algebra curriculum. During the course of the workshop, participants will:

- Explore College Algebra from the perspective of the recommendations made by the MAA Guidelines for College Algebra, published January, 2007.
- Explore and create problems that make use of contextual situations to motivate the mathematics being taught in College Algebra.
- Engage in discussion with instructors and students that have taught and taken a refocused College Algebra course.
- Engage in discussion with faculty from the partner disciplines about the needs of their students taking a College Algebra course.
- Engage in discussion with each other discussing their own personal experiences with College Algebra, and present at the end of the workshop plans for changes they could make afterwards.
- Learn about incorporating a modeling perspective into the curriculum and using modeling-based-problems as an emphasis in the course.
- Learn about a number of available textbooks and other resources which can be used to assist in transforming from a traditionally-based course.

- Learn about new forms of technology which can be used to assist in motivating communication and representation, and then discuss ways of using the technology at their own university.
- Draft a syllabus and organize the framework for a College Algebra course taught in a refocused manner.
- Create materials, problems, and assessment items which would be incorporated into their future refocused course.

Facilitator and participants will hold a reunion during the AMS/MAA Joint Meetings in San Francisco during January, 2010. This reunion will be combined with a reunion of the Historically Black College and University (HBCU) participants that are working with Don Small on the refocusing of College Algebra.

[2] **HBCU Retreat and Follow-On Program**

The HBCU Retreat and Follow-On program to refocus college algebra has two parts. The first part is a four day faculty development workshop held at the U.S. Military Academy for teams of two to four faculty members from selected Historically Black Colleges and Universities (HBCUs). The second part involves the selected schools piloting their own refocused program for at least two years. The Retreat engages participants in hands-on experiences central to a refocus course designed to develop students to become exploratory learners and to develop students' problem solving abilities in the modeling sense. Small group work, developing communication skills, appropriate use of technology, and modeling real-life situations characterize the Retreat activities. Each school team is assigned a mentor who assists the team in developing a draft syllabus for a refocused program that

is suitable to their school. During the two-year follow-on period, the mentors continue to work with their teams through on-site campus visits, e-mail and telephone calls, and organized Reunion session at national meetings. Each school is offered the opportunity to apply for a \$5,000 mini-grant to help facilitate their work in refocusing their college algebra course.

Seventeen HBCUs have participated in the program over the past three years. The list of the schools with the names of the team members are:

2006 Cohort #1 (Retreat, 5-8 June 2006)

Albany State University (Mentor: Dennis Davenport) Team: Zephyrinus Okonkwo, Connie Leggett, Jerome Myricks

Florida Memorial University (Mentor: Archie Wilmer) Team: Thelma Lawton, Carlos Canas, Abbas Zadegan

Fort Valley State University (Mentor: Tony Johnson) Team: Josephine Davis, Ugur Tanriver, Samuel Cartwright

Howard University (Mentor: Donald Outing) Team: Jill McGowan, David James, Paul Bezandry

Savannah State University (Mentor: Don Small) Team: Mulatu Lemma, Jonathan Lambright, Hyoun Oh

Virginia State University (Mentor: Laurette Foster) Team: Cheryl Adeyemi, Eleanor Poarc-Wall, Gerald Burton; Bob Weimer replaced Gerald Burton on the team

2007 Cohort #2 (Retreat, 4-7 June 2007)

Fayetteville State University (Mentor: Tony Johnson) Team: Asitha Kodippili, Perry Gillespie, Pamela Williams

Paine College (Mentor: Don Small) Team: Komala Balakrishnan, Reuben Kesler, Lonell Pontoo

Prairie View A&M University (Mentor: Laurette Foster) Team: Arouna Davies, Michael Williams, Dorothy Muhammad

Southern University (Mentors: Archie Wilmer, Donald Outing) Team: Katrina Cunningham, Caroline Robbins, Marlena Batiste

University of the District of Columbia (Mentor: Dennis Davenport) Team: Venise Steadman, Jeff Fleming, Beverly Anderson

2008 Cohort #3 (Retreat, 11-14 June 2008)

Bethune-Cookman University (Mentor: Archie Wilmer) Team: Candy Hodges, Tom Roper

Harris-Stowe State University (Mentor: Tony Johnson) Team: Ann Podleski, Bruce Green

Johnson C. Smith University (Mentor: Laurette Foster) Team: Nailong Guo, Gerald Agbegha

Lincoln University (Mentor: Tony Johnson) Team: Bernadette Turner, Donna Stallings

Livingstone College (Mentor: Laurette Foster) Team: Douglas Brown

Saint Paul's College (Mentor: Don Small) Team: Sunday Adesuyi, Yahya Njai, David Mitra, Siva Sivakumaran

Program Mentors are: Don Small (U.S. Military Academy), Dennis Davenport (Howard University), Tony Johnson (U.S. Military Academy), Laurette Foster (Prairie View A&M), Donald Outing (U.S. Military Academy), Archie Wilmer (U.S. Military Academy). The external evaluator for the program is Kathi Snook (U.S. Military Academy, retired). The program is funded through a National Science Foundation grant and grants from the Army Research Office.

[3] **Thoughts for Planning a New Semester**

The “tone” of a course is established in the first couple of weeks of the semester. It is

impossible to overemphasize the importance of the first few classes in firmly establishing course policies on homework, attendance, class preparation, class participation, exploration, etc. The absence of explicitly stated and enforced policies will only strengthen the students’ paradigm of how a mathematics course is conducted. For many, this paradigm is that the instructor lectures on how to work certain exercises or procedures, illustrates with some examples, and then mimics these examples on homework and test questions. Thus the thinking that the route to getting a good grade is to memorize and then regurgitate.

Ken Bain in his book *What the Best College Teachers Do* offers the following partial list of questions for teachers to contemplate in preparing for a new semester.

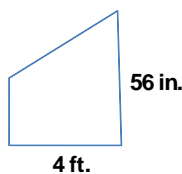
- What are my student Learning Objectives?
- What do I expect of my students?
- How can I create an environment that fosters exploratory learning?
- How can I encourage students to apply themselves, to take risks, to take responsibility?
- How can I assess student growth?
- How can I model learning for my students?

Ken Bain says “The best teachers ask themselves what they hope students can do intellectually, emotionally, or physically by the end of the course and why these abilities are important.” Another quote from his book is that the best teachers “know how to engage and challenge students and believe two things fervently: that teaching matters and that students can learn.”

[4] **Boarding-in the Gable End**

Brady Quinn, the Newburgh Habitat for Humanity engineer, asked Don to close-in the gable end of the house they were building. He said the roof was eight over twelve (meaning

that the height of the roof rose eight inches in a span of twelve inches). He suggested cutting two identical trapezoidal shaped pieces (see the following figure) from a four foot by eight foot piece of plywood. Having measured, Brady knew the longest height was fifty six inches and the width was four feet. How long should the shortest height be?



[5] Query

Alfred has invested in three purchases of Bank of America stock,. He first purchased 100 shares at \$38 per share, then 50 shares at \$27 per share, and finally another 50 shares at \$22 per share. At what price should he sell all of the shares in order to realize a \$500 profit? Would he gain or lose if he sold at \$32 per share and by how much? (Ignore all transaction fees.)

[6] Wake-Up Activities/Questions

Here are a sample of activities/questions that can be used at the beginning of class to help students mentally transfer from their previous activity to your mathematics class.

- a. Describe at least two methods for determining if $\frac{5}{8}$ is larger or smaller than $\frac{11}{25}$.
- b. Explain why “slope” can be described as “rate of change.”
- c. If the average student height in a given class is less than the median height, are there more students with height above the average than below the average? Explain.

[7] Notices

1. The sixth edition of *Contemporary College Algebra: Data, Functions, Modeling* by Don Small is now available. Contact Kathy Kilburg (563-584-6322, Kathhj_Kilburg@mcgraw-hill.com) for an examination copy.
2. The Joint Mathematics Meetings will be held in Washington, DC, January 5-8, 2009.
3. A Reunion of College Algebra Workshop Participants will be held on Tuesday evening in the Diplomat Room of the Omni Hotel from six to eight o'clock on January 6, 2009 as part of the Joint Mathematics Meetings in Washington, DC. Bill Haver and Don Small will facilitate the session. A box supper will be provided.
4. Past issues of the *Vision - Potential* Newsletter are available on our website: www.ContemporaryCollegeAlgebra.org.
5. Deadline for contributions to the February Newsletter is February 1, 2009. Opinion articles, suggestions for writing assignments, small group in-class activities, small group out-of-class projects, Queries, announcements, etc. are welcomed.
6. To subscribe to this Newsletter, write to Don Small, Department of Mathematics, U.S. Military Academy, West Point, NY 10996 or contact him via e-mail at don-small@usma.edu.