APPLICATION OF ASSESSMENT TO MATHEMATICS (AAM) GROUP

Record of Meetings

Fall 2003 - Spring 2006

APPLICATION OF ASSESSMENT TO MATHEMATICS (AAM) GROUP

**Record of Meetings
2003-2004**

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, September 15, 2003 at 2:00 p.m.

Member Present: K. Herron, L. Marino, P.Wursthorn

The AAM Group decided to review the content of Math 046, Math 080, Math131, and Math 133 and the interfaces between these courses. A driving purpose of this review is to provide better assurance that students who complete one of these mathematics courses have the prerequisite understanding of mathematics content and mathematical skills to successfully complete the immediate sequel to the course. It was decided that the Group should start the review by working from Math 131 to Math 080 and to Math 133. Also the Group agreed that L. Marino and P. Wursthorn would review the Chemistry course content for the purpose of providing better assurance that students who complete one of these mathematics courses have the prerequisite understanding of mathematics content and mathematical skills to successfully complete Chem 111. K. Herron agreed to send a copy of pertinent course outlines to each member of the Group, to list the topics in which Math 131 students are weak, and to identify which of the listed topics are in the Math 080 curriculum as specified by the Math 080 course outline.

The AAM Group agreed to meet on Monday, September 22, 2003 in the Lobby on the ninth floor at 2:00 p.m. and to subsequently meet every other week on Mondays at 2:00 p.m. (Recorder's Note: On Monday, September 22, 2003, the Group agreed to meet every week at 2:00 p. m.)

Recorded by,

Peter A. Wursthorn

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, September 22, 2003 at 2:00 p.m.

Member Present: K. Herron, L. Marino, P.Wursthorn

The AAM Group reviewed a list of topics, submitted by K Herron, in which Math131 is weak and P.Wursthorn submitted a list of Chem 111 mathematics topics. L. Marino emphasized the need to assure that Math 080 students attain a good working understanding of slope and linear relationships between two variables. It was agreed that in Math 080, students should be expected to find the slope of a line and to apply the concept to real world problems. Given a line, Math 080 students should be expected find its equation in point-slope form and in slope-intercept form. The Group will consider

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categorizing course-outline outcomes into major and minor outcomes or according to whether the same topics are covered in a course for the first or second time.

The AAM Group agreed to meet on Monday, September 29, 2003 in the Lobby on the ninth floor at 2:00 p.m. and to subsequently meet every week on Mondays at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

– III –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, September 29, 2003 at 2:00 p.m.

<u>Member Present</u>: P. Duncan, K. Herron, L. Marino, P.Wursthorn

Discussion centered on revising and clarifying the Math 080 learning objectives and learning outcomes. In proceeding from one course to the next in a sequence of mathematics courses, some topics are continued from the former to latter, whereas others are introduced for the first time. [<u>Recorder's note</u>: Continued topics would usually be treated more rapidly in the sequel course as a review, or they would be extended and deepened.] It was agreed that some form of designation should be used to distinguish those topics presented for the first time in the sequence (new, ongoing, ??) from those that are continued from a previous course in the sequence (continuing ??). [<u>Recorder's note:</u> This provides further support for thinking of the mathematics sequence 046, 080, 131, and 133 as a unified whole.]

In–progress, suggested changes in Math 080 Course Outline follow:
<u>Recorder's Note</u>: Maybe we need yet another LObj that includes underlying concepts such as LObj1 below.

LObj1: Foundation concepts for algebra.
    LOuts
    a) Identify and use real number axioms and zero factor property [We will need to identify any other properties (theorems) of the real numbers that need be included.]
    b) Add, subtract, multiply, and divide signed numbers, including rational numbers and decimals
    c) Simplify algebraic expressions – like terms, order of operations
    d) Evaluate powers having integer exponents
    e) Use laws of exponents [Note: Currently this is not include in 080 or 046 outline, is it?, Should it be included? This would be an increase in content.]

LObj2 Concepts related to equations
  LOuts
  a) Solve equations that can be reduced to a linear equation in one variable
      i)   Apply addition, subtraction, multiplication and division properties of equality to reduce equations to the form, $x = k$
      ii) Substitute given numbers in a formula to produce an equation in one variable
  b) Solve equations in several variables for a first degree variable in terms of the remaining variables – concept of formula, literal equation
  c) Solve a quadratic equation in one variable by factoring method.

LOBj3 Concepts related to polynomials
  LOuts
  a) Identify a polynomial
  b) Evaluate a polynomial
  c) Add, subtract, multiply, divide polynomials [Rec's Note: Division of a polynomial by a polynomial is an addition to prior course outline content.]
  d) Factor polynomials over the integers (common factor, difference of squares, general trinomials, perfect square trinomials)

LOBj4 Concepts related to the graph of an equation in two variables
  LOuts [Rec's Note: Maybe this section needs strengthening.]
  a) Find solutions of linear equations in tow variables
  b) Graph sets of ordered pairs on a coordinate system
  c) Graph a linear equation in two variables by substitution method
  d) Calculate and interpret slope of a line

L. Marino introduced statistical printout produced by IR that tracked students who took Math 080. It was observed that these statistics may have a bearing on AAM's deliberations.

The course outlines need to be reviewed for Typos. For example, the Math 080 Learning Objectives heading needs to be corrected; the Math 046 learning outcome "a" relative to the third Lobj needs correction. Misalignment needs correction.

The next meeting of the AAM Group is scheduled for Monday, October 6, 2003 in the Lobby on the ninth floor at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, October 6, 2003 at 2:00 p.m.

<u>Member Present</u>: P. Duncan, K. Herron, L. Marino, P.Wursthorn

In the continued effort to clarify the learning objectives and learning outcomes in the core mathematics sequence (Math 046, Math 080, Math 131), the AAM Group reviewed a Math 080 examination that had been administered after the passage of one month in the 2003 Fall Semester. The AAM Group categorized each question as <u>continuing</u> (i.e. represents a topic addressed in Math 046) and <u>new</u> (i.e. a topics that in the core mathematics sequence are addressed for the first time in Math 080). The Course outline should distinguish between continuing and new topics or, better said, between continuing and new learning outcomes. A verbal statement that describes how continuing topics (learning outcomes) should be treated differently from new topics (learning outcomes) needs to be formulated.

The following questions were identified as <u>continuing</u>.

1. Evaluate $\quad -5-2\cdot3-(-5)+(0)^2-(-2)^3 = \underline{\quad\quad}$

2. Evaluate the following expressions given that $x = -3$, $y = -1$, and $z = 2$.

    a) $z-(x-y) = \underline{\quad\quad}$ b) $x^2+y^2+z^2 = \underline{\quad\quad\quad}$

    c) $(x+y+z)^2 = \underline{\quad\quad}$ d) $3x^2-2y^2 = \underline{\quad\quad}$

3. Solve for the indicated variable.

a) $\quad 5-6x=-25$ b) $\quad -12-(8-2y)=-2(y+6)$:

c) $\quad \dfrac{-5(w+3)}{2}=-20$

4. a. The commutative axiom for multiplication says that xy = yx. Rewrite the following using <u>only</u> the commutative axiom for multiplication.
$$(3+7v)\cdot8 = \underline{\quad\quad\quad\quad}$$

  b. The commutative axiom for addition says that x + y = y + x. Rewrite the following using <u>only</u> the commutative axiom for addition.
$$56+8\cdot v = \underline{\quad\quad}$$

c) The left distributive axiom says that z(x + y) = zy + zx. Rewrite the following using <u>only</u> the left distributive axiom.
$$-5(w+(-3)) = \underline{\quad\quad\quad\quad}$$

d) The identity axiom for multiplication says that for any real number x, $x\cdot1=x$. Rewrite the following using <u>only</u> the identity axiom for multiplication.
$$(3x+7y)\cdot1 = \underline{\quad\quad\quad\quad}$$

5. Express the following using algebraic notation.

a)   "Ten more than y is equal to s."$\underline{\quad\quad\quad\quad\quad\quad}$

b) "The Product of 18 and z is greater than W." _____

c) "Three less than three times z is equal to 24 less than x." _____

d) You deposited $7200.00 in two accounts; one is a CD, and the other is a mutual fund. If you deposited x dollars in the CD, how much did you deposit in the mutual fund? The amount in the mutual fund = _____.

e) The wattage of a light bulb A is y watts. The wattage of bulb B is 30 Watts less than five-sevenths the wattage of bulb A. The wattage of bulb B = _____

The following questions were identified as <u>new</u>.

0) The amount of money, A, to which a principal, P, will accumulate in t years at a simple interest rate, r, is given by the formula $A = P + Prt$. Solve for r in terms of A, P , and t.

1. Solve the inequality, $-9(x-2) > 45$, and graph its solution set on the accompanying number line. Label the number line to indicate the scale.

2. a) Find the height, h, of the figure if its area, A, is equal to $720 \, cm^2$.
   b) Find the perimeter of the following geometric figure.

$$A = base \cdot height + \pi \cdot \frac{(base)^2}{4}$$

$$Perimeter = base + 2 \cdot height + \pi \cdot \frac{(base)}{4}$$

a) h = _____
b) Perimeter = _____

h
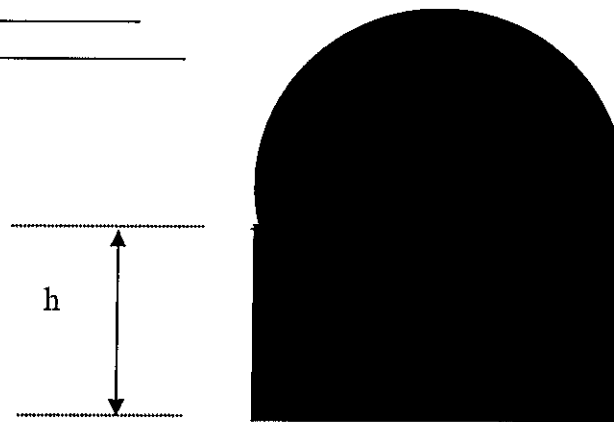
base = 22

3. The following equation relates the value of a bulldozer, y, (in dollars) to the time, x, (in hours) that it has been in service. $y = -12 x + 72{,}000$. Solve for x in terms of y.

4. The width of a rectangle is 20 cm less than its length. The perimeter of the rectangle is 400 cm. What are the dimensions of the rectangle? Solve this problem algebraically.

It was observed that there may be a need to review the placement test vis-à-vis the learning outcomes in the core mathematics sequence. Also, the need to address geometry learning outcomes was mentioned.

The next meeting of the AAM Group is scheduled for Monday, October 13, 2003 in the Lobby on the ninth floor at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

– V –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, October 13, 2003 at 2:00 p.m.

<u>Member Present</u>: K. Herron, L. Marino, P.Wursthorn

The AAM Group reviewed the document entitled, "Compilation of work in Progress on Math 080" dated October 6, 2003 which is contained in a memorandum dated October 7, 2003. It was decided that learning outcome (f) under learning objective 2 - Formulate a quadratic equation that models an authentic situation, and use the equation to explore the situation - should be moved to the Math 131 outline. Also, learning outcome b(iv) - Set up a number scale for quantities - should be amended and moved under learning objective 4. Finally, the word, metric, should replace SI. These decisions are reflected in the attached "Compilation of work in Progress on Math 080" dated October 13, 2003.

The AAM Group decided that, in preparation for the next meeting, it would analyze the scope of Math 080 and decide whether students are best served by increasing the number of Math 080 semester-hours to four or by retaining it as a three semester-hour course. In like vein, the Group will continue to deliberate on whether it is best to retain the current graphing calculator requirement for Math 080 or to require only a scientific calculator.

<u>Recorder's Note</u>: In the interest of clarity and communication it might be well if we developed examples for those areas "noted" in the attached "Compilation of work in Progress on Math 080".

The next meeting of the AAM Group is scheduled for Monday, October 20, 2003 in the Lobby on the ninth floor at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, October 20, 2003 at 2:00 p.m.

<u>Member Present</u>: K. Herron, L. Marino, P.Wursthorn

The AAM Group reviewed and revised the document entitled, "Compilation of work in Progress on Math 080" dated October 13, 2003. The revisions took into account Connecticut Community College System approved "Elementary Algebra Topics". "Define, find, and use real roots of numbers" was added as item (f) under LObj1. "Solve single variable inequalities" was added as item (e) under LObj2. Division of polynomials, item (d) was removed from LObj3. "Customary System" was removed from item (i) under LObj5. There was discussion on whether some items under LObj5 should be removed and how best to treat the items under LObj5. The latest draft, of "Compilation of work in Progress on Math 080", dated October 21, 2003, is attached.

In an effort to give concrete meaning to various Learning Outcomes, K. Herron submitted the following:

Example of LObj2,(d) - Formulate a linear equation that models an authentic situation, and use the equation to explore the situation

1) Jose's rental car agency charges $99.00 per week plus $0.25 per mile to rent a small car. How many miles can you travel for $300.00?
2) After a 30% reduction, you buy a DVD player for $250.00. What was the price of the DVD player before the reduction?

Example of LObj4,(i) - Formulate a linear equation in two variables that models an authentic situation and use the equation to explore the situation

1) Jose's rental agency charges $45.00 per day plus $30.00 per mile to rent a mid-size car, Write an equation that represents the total cost to rent a mid-size car for one day. Then find the cost if you drove 200 miles on that day.

L. Marino requested that we mull over questions regarding statistics that might support the efforts of the AAM Group and that she would submit such questions to the Institutional Researcher.

[Recorder's Note: The following are examples for LObj4,f - Calculate and interpret the slope of a line]
1) Assume that the relation between the thickness, y, (in millimeters) of a particular car's right front brake pad and its age, x, (in years) is linear. When the car was 2 years old, the brake bad was 12 mm thick; when the car was 8 years old, the brake pad was 2 mm thick. (1) Sketch the line that describes this relation on the

following coordinate system. (2) What is the slope of the line? (3) What does the slope mean in this particular context? Be sure to set up appropriate scales for the x-and y-axes, and label the coordinates of the two points through which the line passes.

2) Assume that the relation between the thickness, y, (in millimeters) of a particular car's right front brake pad and its age, x, (in years) is linear. The thickness of the brake pad decreases 4 mm for every 2 years that the car ages. When the car was three years, the brake bad was 18 mm thick. (1) Sketch the line that describes this relation on the following coordinate system. (2) What is the slope of the line? (3) What does the slope mean in this particular context? Be sure to set up appropriate scales for the x-and y-axes, and label all pertinent points.

Recorder's Note: In the interest of clarity and communication it would be well to continue developing examples for those areas "noted" in the attached "Compilation of work in Progress on Math 080" and to critique the examples.

The next meeting of the AAM Group is scheduled for Monday, October 27, 2003 in the Lobby on the ninth floor at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

– VII –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, October 27, 2003 at 2:00 p.m.

Member Present: K. Herron, L. Marino, P.Wursthorn

The AAM Group discussed the statistical information and its form that would best serve the AAM Group's need to determine the mathematics persistence of students who enter the CCC mathematics curriculum at different points. The Group decided to request the following statistics from the College's Institutional Research Division.

1. Take the cohort of Math 046 students enrolled during the academic year 1998-1999, and determine the percentage who have:
   a) successfully completed Math 080 by January 2003
   b) successfully completed Math 131 by January 2003
   c) successfully completed Math 124 by January 2003
   d) successfully completed Math 133 by January 2003
   e) not successfully completed any of the above
   f) who have transferred to another college

2. Take the cohort of Math 080 students enrolled during the academic year 1998-1999 who had not previously taken Math 046, and determine the percentage who have:
   a) successfully completed Math 131 by January 2003
   b) successfully completed Math 124 by January 2003
   c) successfully completed Math 133 by January 2003
   d) not successfully completed any of the above
   e) who have transferred to another college

3. Take the cohort of Math 131 students enrolled during the academic year 1998-1999 who had not previously taken Math 080, and determine the percentage who have:
   a) successfully completed Math 124 by January 2003
   b) successfully completed Math 133 by January 2003
   c) not successfully completed any of the above
   d) who have transferred to another college

Each year the starting and ending years will be incremented by one and the procedure will be repeated to produce a new set of values for the statistics.

L. Marino will advance and explain the above request to the College's Institutional Research Division.

It was reported that the Academic Dean was interested in attending the S&M Department meeting for the purpose, at least in part, of discussing the mathematics group's response to the assessment findings of 2002-2003. The group decided to invite the Academic Dean to its AAM Group meeting on Monday, November 3, 2003. The meeting will convene at 1:45 in the lobby on the 9th floor. K. Herron volunteered to extend this invitation to the Academic Dean. [Recorder's note: The Academic Dean has accepted the AAM Group's invitation.]

L. Marino suggested that some of the completed problems that strive to give concrete, contextual meaning to slope be preceded by very simple problems with the same goal. The AAM Group decided to create such simple introductory problems. With respect to this, Attachment I contains examples of problems that attempt to communicate the meaning of certain Math 080 learning objectives.

It was agreed that the following Learning Outcome be moved from Learning Objective 1 to LOBj5.
Justify and use the following identities:
$$(aA)(bB) = (ab)(AB)$$

$$\frac{aA}{bB} = \frac{a}{b} \cdot \frac{A}{B}$$

Attachment II is the most recent draft of the Math 080 LOBjs.

The next meeting of the AAM Group is scheduled for Monday, November 3, 2003 in the Lobby on the ninth floor at 1:45 p.m.

Recorded by,

Peter A. Wursthorn

– VIII –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, November 3, 2003 at 1:45 p.m.

<u>Member Present</u>: K. Herron, L. Marino, P.Wursthorn,
     Guests: Dean Mary Ann Affleck,
       Leonel Carmona, Coordinator of the Learning Center

L. Marino reported on the AAM Group's request to the Institutional Research Department for annually updated statistics that show the five-year CCC mathematics course records, in aggregate, of students who commence in particular courses. L. Marino reported that Jennie Wang of the Institutional Research Department indicated that provision of such statistics could be done.

L. Carmona provided a spreadsheet that pertained to the number of CCC students who take more than introductory level mathematics courses. The spreadsheet showed that approximately 88% of CCC students who took mathematics in Fall 2003 were enrolled in Math 131, Math 080, or Math 046. In this context, it was noted that the Nursing Program does not require students to take a credit mathematics course.

Dean Affleck stated that she was interested in the following three questions, and she invited the AAM Group to respond to each as the Group continues its ongoing deliberations.

1) Are there resources that the College could provide that would beef up the mathematics program?
   Immediate responses included:
   a) Support for arranging semester meetings that would include all adjunct mathematics faculty
   b) Support for professional development activities related to mathematics education.
   c) Support for professional development activities that could be made available on the WEB.
   d) Support for enforcement of the established enrollment limit of 25 in developmental mathematics classes.

2) Should we reëxamine mathematics tutoring done by the Mathematics Center?
   Immediate responses included:

a) Consider supplemental instruction in the form of weekly reinforcement/review sessions that are either an integral part of a regular course or are closely articulated with a regular course.

b) Consider supplemental instruction made available via links from the class shells or via a dedicated shell. Dean Affleck noted that next year the College will have the capacity to stream media through the shells.

c)

3) Relative to the upcoming NEASC accreditation review of CCC, should we assess student mathematics level of understanding at time of graduation? Dean Affleck observed that NEASC is very interested in the assessment feedback loop. L. Marino expressed reservations about using an exit examination as a tool for measuring the effect of program changes on student mathematics learning.

L. Marino mentioned the possibility of increasing Math 080 contact hours from 3 to 4.

Dean Affleck informed the AAM Group that:
- the Institutional Researcher had informed her that he could provide the statistics requested by the AAM Group by February 2004, and
- the Adjunct Faculty orientation for the Spring 2004 would be broken into two parts – a general meeting and a department meeting.

The next meeting of the AAM Group is scheduled for Monday, November 10, 2003 in the Lobby on the ninth floor at 2:00 p.m.

Recorded by,

Peter A. Wursthorn

pc: Dean Mary Ann Affleck,   Leonel Carmona, Coordinator of the Learning Center

– IX –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, November 10, 2003 at 2:00 p.m.

Member Present: K. Herron, L. Marino, P.Wursthorn

Most of the meeting was devoted to deliberating on the feasibility of transforming Basic Algebra to a 4 semester-hour course. Relative to this, K.Herron indicated that the problems of scheduling classes for such a course would need to be one of the considerations. K.Herron reported that she had contacted Joe Karnowski of Norwalk Community College (NCC) as a first step in exploring what NCC's experience has been with the 4-semester-hour Basic Algebra course that it offers.

After a discussion regarding the type of information that would be helpful relative to a 4-semester hour Basic Algebra course, K. Herron stated that she would ask Joe Karnowski the following questions.

- How long has NCC been offering a 4-semester-hour Basic Algebra course?
- Is there a prerequisite for the NCC Basic Algebra course?
- What is the system for scheduling the NCC Basic Algebra classes, especially with reference to the schedule for 3-hour courses? What is the evening schedule? What is the day schedule?
- How effective has the 4-semester-hour Basic Algebra course been?
- (NOTE: This is an addition by the Recorder: What is the content of the NCC Basic Algebra course? Can we obtain a course outline?)

Relative to the 2004 Spring Semester orientation of adjunct faculty, the AAM Group recommends that the orientation occur on Tuesday, January 20, 2004 and that the adjuncts be provided with stipends to support their involvement. L. Marino will forward this recommendation to the Academic Dean.

The next meeting of the AAM Group is scheduled for Monday, November 17, 2003 in the Lobby on the ninth floor at 2:30 p.m.

Recorded by,

Peter A. Wursthorn

– X –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, November 25, 2003 at 2:30 p.m.

Member Present: K. Herron, L. Marino, P.Wursthorn, Leonel Carmona

The meeting opened with a discussion relative to increasing the Math 080 semester hours from three to four. K.Herron reported on questions that she had asked Joe Karnowski about NCC's experience with a three-semester hour Basic Algebra course. The NCC course has been in place for six year; students have not objected to it; scheduling it has not posed a problem. L. Marino noted that problems in scheduling such a four-semester hour course would be reduced if the Math 080 day classes began a 8:00 am and if the evening Math 080 classes began at 5:00 pm. L.Marino suggested polling Math 080 students to find out what their views are relative to scheduling a four-semester hour Basic Algebra course. It was decided that we would develop a survey, poll classes, and also, at L. Carmona's suggestion, make the survey available to students in the Math Center.

Survey choices would be:

2 class meetings per week for 1 hour 40 minutes each
3 class meetings per week for 1 hour 17 minutes each
4 class meetings per week for 50 minutes each

It was noted that providing students with mathematics placement test information that would encourage them to prepare for the test would yield more valid placement results.

The remainder of the meeting addressed Carol McMahon's request for input relative to allocation of new faculty positions within the S&M Department. At the request of the AAM Group, professor Frost answered questions relative to the needs of a chemistry faculty position

The next meeting of the AAM Group is scheduled for Tuesday, December 2, 2003 in the Lobby on the ninth floor at 2:30 p.m.

Recorded by,

Peter A. Wursthorn

– XI –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Tuesday, December 2, 2003 at 2:30 p.m.
(Corrected version of prior record of this meeting – The prior record stated that the meeting occurred on Monday, December 2nd rather than on Tuesday, December 2nd. Also the times for the next meeting were penciled in.)

Members Present: L. Carmona, K. Herron, L. Marino, P. Wursthorn,

The meeting opened with a discussion relative to arranging a meeting with the adjunct faculty. The purpose of such a meeting is to establish more effective, ongoing communication between full-time mathematics faculty and adjunct faculty and to assist adjunct faculty to become better acquainted with directions being taken by the S&M Department, the College, and mathematics education. The AAM group recommends that the adjunct mathematics faculty be invited to a meeting scheduled for Tuesday, January 20, 2004 at 4:00 p.m., that for the adjunct mathematics faculty this meeting will be in lieu of any other meeting scheduled at the beginning of the 2004 Spring Semester for adjunct faculty, and that the adjunct participants be provided with some form of incentive to attend the meeting. The latter might be a stipend, membership dues for MATYCONN, a certificate for a book purchase, or some other pertinent item.

The AAM group then directed its attention to reviewing and continuing to revise the latest draft of the Math 080 course outline and the addendum to it. The first four objectives and their associated learning outcomes are virtually complete.

P. Wursthorn will work on developing more examples for the addendum; K. Herron will edit and revise the geometry/applications section; L. Marino will speak with C. McMahon and/or M. Affleck relative to the proposed adjunct faculty meeting; and L.Carmona will attempt to send to P.Wursthorn a Word copy of the PDF Math 080 course outline. Also the AAM members will further survey students about their scheduling preferences for a potential 4 semesester-hour Math 080 course. Relative to the latter, K.Herron reported that the students in one of her mathematics classes overwhelming favored a two-day schedule.

The next meeting of the AAM Group is scheduled for Monday, December 8, 2003 in the Lobby on the ninth floor at 1:45 pm.

Recorded by,

Peter A. Wursthorn

– XII –

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, December 8, 2003 at 1:45 p.m.

Members Present: K. Herron, L. Marino, P. Wursthorn

The meeting was devoted to considering changes in the 12/18/03 Basic Algebra course outline draft (versions1 and 2) and the associated addendum that were suggested by the AAM members. The AAM members agreed to several substantive changes as well as editing revisions. P. Wursthorn was charged with preparing a draft of the course outline and associated addendum that reflected the changes. The AAM members agreed to propose that the semester hours for MATH 080 be increased from three to four and that they would forward this proposal with the course outline and addendum to the S&M Dept. for its approval.

The next meeting of the AAM Group is scheduled for Monday, December 15, 2003 in the Lobby on the ninth floor at 1:45 p.m.

Recorded by,

Peter A. Wursthorn

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, December 15, 2003 at 1:45 p.m.

Members Present: K. Herron, L. Marino, P. Wursthorn
Guest: L. Carmona

The meeting began with a discussion of the progress made toward arranging a meeting on Tuesday, January 20, 2003 for 2004 Spring Semester adjunct mathematics faculty. The meeting also would include all full-time instructors who teach mathematics during Spring 2004. L Marino indicated that she had explored sources of potential funding for one-hundred dollar stipends for between 10 and 12 adjuncts. Sources included the UTC fund, 4C's Fund for adjuncts, and Center for Teaching fund. Lynn has spoken with Carol McMahon and Mary Ann Affleck relative to the proposed meeting and she will advance the pertinent paperwork.

K.Herron volunteered to draft a letter of invitation to the proposed meeting. The meeting agenda will include:
- Review of curriculum assessment activities as they pertain to mathematics
- Proposed changes in mathematics courses.
- Final exam core question sets
- Comprehensiveness of final examinations – current practices relative to final exams
- Current trends in mathematics education
- Use of the Math Center

The proposed meeting needs a title, perhaps "Mathematics Gathering". The location for the meeting will be the Math Center.

The rest of the meeting was devoted to considering changes in the Basic Algebra course outline draft and the addendum draft. L. Carmona will provide a metric conversion chart for the addendum. Changes were made and P.Wursthorn will incorporate them into a new draft that will be forwarded to the S&M Dept. for its approval.

The next meeting of the AAM Group is scheduled for _____

_____.

Recorded by,

Peter A. Wursthorn

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Monday, December 22, 2003 at 1:00 p.m.

<u>Members Present</u>: K. Herron, L. Marino, P. Wursthorn

A formal decision was made to advance the proposed new Math 080 course, which the AAM group had developed during the 2003 Fall Semester, to the Science and Mathematics Department for its action. The submitted proposal is identified by "12-18-03: Draft submitted for S&M approval". P. Wursthorn agreed to submit the proposal, with sufficient copies for the Department, forthwith to Carol McMahon.

The second matter of business involved reviewing the following agenda draft for the Adjunct Mathematics Faculty meeting scheduled for Tuesday, January 20, 2004 from 4:00 to 6:00.
Agenda:
- Review of curriculum assessment activities as they pertain to mathematics
- Proposed changes in mathematics courses.
- Final exam core question sets
- Comprehensiveness of final examinations – current practices relative to final exams
- Current trends in mathematics education
- Role of Math Center

An introductory overview will be added to the agenda.

The tasks of leading the agenda item discussions were assigned to each AAM member as follows:

K. Herron - Review of curriculum, proposed changes in Math 080, and current final
    examination practices
L. Marino – Adjunct evaluations
P. Wursthorn – Trends in mathematics education
L. Carmona – AAM group will ask L.Carmona to discuss the role of the Math Center

Also, the group apportioned responsibility for bringing refreshments to the meeting.

The next meeting of the AAM group is scheduled for Tuesday, January 20, 2004 at the close of Professional Day activities and prior to the Adjunct Faculty meeting.

Recorded by,

Peter A. Wursthorn

APPLICATION OF ASSESSMENT TO MATHEMATICS (AAM) GROUP

Record of Meetings
2004-2005

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Tuesday, September 14, 2004 at 3:00 p.m.

<u>Members Present</u>: A. Freeman, L. Carmona, P. Wursthorn

P. Wursthorn opened the meeting by outlining its purpose, providing a very brief history of AAM work during the past academic year, and reminding the members that AAM is not a policy making body but may bring recommendations to the S&M Department meetings for its action.

The main agenda item for the meeting involved developing a prioritized list of tasks that AAM should undertake during the Academic Year 2004-2005. This included the following:

- Developing a vehicle for assessing the effects of changes in the mathematics curriculum. With exception of item "f" the changes were implemented in Fall 2004.

    [Note: The recorder provided the following list of changes.]
    a. Increasing the contact hours of the non-credit algebra course from 3 to 4 to
       to establish *Introductory Algebra* (MAT* G094)
    b. Changing the technology requirement of *Introductory Algebra* from a
       graphing calculator to a scientific calculator
    c. Placing greater emphasis on links between *Introductory Algebra* and Chemistry
    d. Making certain curriculum changes in *Pre-Algebra, Number Sense, Geometry* (MAT* G075)
    e. Making certain curriculum changes in *Intermediate Algebra* (MAT* G137) and introducing the expectation that students would learn the material in greater depth (particularly with respect to linear equations in two variables, the graphs of linear equations in two variables, and basic functions) so that they would be better prepared to successfully take its sequel, Precalculus (MAT* G186).]
    f. NOTE: Approximately three years ago (the exact date of implementation needs to be determined) *Intermediate Algebra* replaced *Introductory Algebra* (or what at the time was *Basic Algebra* —Math 080 as prerequisite for *Probability and Statistics*-Math 124. The latter course is now titled *Statistics with Technology* – MAT* G167. The effect of this change has not been assessed.

1.   An Assessment vehicle that compares the success rate of students in MAT* G137 who have taken MAT* G094 as prerequisite with the success rate of Math 131 students who took Math 080 as prerequisite

2.   An Assessment vehicle that compares the success rate of students in MAT* G094 with the success rate of students in Math 131

3.   An Assessment vehicle that addresses students' understanding and application of graphing, linear equations in two variables, and slope.

4.   An Assessment vehicle that compares the success rate of students in *Statistics with Technology*-MAT* G167 before *Intermediate Algebra* became a prerequisite with the success rate of students in *Probability and Statistics* when Math 080 was the prerequisite.

5.   NOTE: This item was suggested to the recorder subsequent to the AAM meeting by L. Marino. An Assessment vehicle that seeks to determine whether students who have taken MAT* G094 are better prepared to take Chemistry 111 than students who took Math 080.

It was agreed that any assessment vehicle must be designed and administered so that it is not and cannot be used to evaluate faculty.

- Examine ways to make available to CCC students the full range of Freshman/Sophomore-level mathematics courses.
    1. Topics in Contemporary Mathematics is not offered this semester.
    2. L. Carmona suggested revisiting the question of developing a 3-credit Trigonometry course rather than a one-credit course.
    3. A. Freeman suggested identifying a set of mathematics and mathematics related courses that could be packaged, offered, and advertised as a two-year transfer curriculum.

- Consider the proposition that MAT* G075 should not be offered in four-week format during the summer session.
- The course outline and catalog description for Calculus I and Calculus II need to be brought into agreement relative to requirements for a graphing calculator and a computer algebra system.
- Create application problems for MAT* G075, MAT* G094, MAT* G137, and MAT* G167/
- Consider the semester-to-semester schedule that would take fullest account of the intellectual demands of Calculus I and Calculus II and, at the same time, attract the most students.
- Oversee the process of creating core problems for the MAT* G075, MAT* G094, and MAT* G137 final examinations.

It was agreed that all members of the AAM would reflect on the foregoing task list, modify it as needed, and bring any further areas of activity that the AAM should address during this academic to the next meeting.

The next meeting of the AAM Group is scheduled for Tuesday, September 28, 2004 in the Lobby on the ninth floor at 3:00 pm.

Recorded by:

Peter A. Wursthorn

pc: L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, P. Duncan, C. McMahon - S&M Chair

- II -

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Tuesday, September 28, 2004 at 3:00 p.m.

Members Present: A. Freeman, L. Carmona, P. Wursthorn

I. P. Wursthorn opened the meeting by distributing mathematics courses outlines that were in accord with course content changes approved during the AY 2003-2004, that followed the approved course-outline format, and that used the common course numbering system. In this set of course outlines, three were absent, viz. *Caluculus I, Math for Elementary ED I, and* Applied Calculus. [Recorder's NOTE: P. Wursthorn subsequently distributed the course outlines for *Caluculus I, Math for Elementary ED I.* Thus, at this time, only the course outline for *Applied Calculus* is not up-to-date. The recorder is unsure about whether *Applied Calculus* remains among CCC's course offerings and will check on its status] The members agreed to inform P.Wursthorn of any errors that they may find in the course outlines prior to declaring them "WEB ready". This is of particular relevance for *Calculus III; Multivariable Calculus* and *Differential Equations* because the existing course outlines for these two courses were not in the currently prescribed learning objective format.

II. P. Wursthorn reported that he had met with the Institutional Researcher, Jenney Wang, to inform her of the assessment proposals that the AAM Group is in the process of formulating, to let her know that the AAM Group will probably ask her to provide data relative to assessing the effects of changes in the mathematics curriculum, and somewhat more generally, to ask if she would think about ways to approach the problem of making such an assessment.

III. Relative to the assessment, L. Carmona distributed a spreadsheet of aggregate baseline data relative to student success in mathematics courses.

III. A. Freeman introduced the question of how best to schedule Calculus-I and Calculus-He proposed that Calculus-I be offered during the day-time in fall semesters and during the evening in spring semesters. He also suggested that Calculus-II be offered during the evening in the 2005 Spring Semester. P. Wursthorn expressed the concern

that students may be able to better meet the demands - the challenging concept development required by the subject — of the four-credit calculus courses if they meet three times per week rather than two times per week. L. Carmona stated that the Math Center could provide the support needed if Calculus were offered during the evenings. P. Wursthorn indicated that he would not be opposed to offering calculus in the evening and thereby experimentally determine the effect that such a change had on enrollment as well as student achievement. The AAM Group decided that this question should be brought before the S&M Department at its next meeting.

IV. The AAM Group agreed that it is very important that students satisfy the prerequisites for a given course before taking that course. The A&M Group will bring this issue to the S&M Dept.

V. P.Wursthorn indicated that L. Marino had suggested the possibility of having the Tutor-Liaisons play a roll in the assessment process. P. Wursthorn said that he would discuss this further with L. Marino and report back to the AAM Group.

VI. The goal of the next AAM Group meeting is to formulate a proposal for assessing the effects of the recent curriculum changes. This will include assessing the students' ability to work with graphs, linear equations, and slope. The latter seems to require some form of embedded question set on final examinations which, when used for assessment, assures that both students and instructors are anonymous.

The next meeting of the AAM Group is scheduled for Tuesday, October 12, 2004 in the Lobby on the ninth floor at 3:00 pm.

Recorded by:

Peter A. Wursthorn
pc: L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, P. Duncan, J.Wang, C. McMahon - S&M Chair

- III -
Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Tuesday, Ocotober 12, 2004 at 3:00 p.m.

Members Present: P. Duncan, A. Freeman, L. Carmona, P. Wursthorn

The meeting addressed the question of how to assess the effects of several recent changes in the mathematics curriculum. As a point of departure for discussion, P. Wursthorn referred to a working draft of Assessment Methods that he had previously circulated via email. That draft did not refer to the change of prerequisite for *Probability and Statistics* (Math 124) from Math 080 to Math 131 that was put into effect for the 2002 Fall Semester. As a result, most of the meeting dealt with the question of assessing the effect of this prerequisite change. As part of the discussion, L. Carmona presented some

pertinent spreadsheet data relative to *Statistics* assessment and A. Freeman raised the question of whether the current placement test cut-off scores are providing the best possible course placement of students.

The results of the AAM discussion are contained in item IV of the addendum to this Record. AAM Group members agreed to review the attached addendum and alter it as they see fit. It was agreed that the AAM Group would attempt, at its meeting of October 26th, to finalize a set of assessment recommendation for presentation to the S&M Department meeting on October 28, 2004.

The next meeting of the AAM Group is scheduled for Tuesday, October 26, 2004 in the Lobby on the ninth floor at 3:00 pm.

Recorded by:

Peter A. Wursthorn

pc: L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, P. Duncan, J.Wang, C. McMahon - S&M Chair

ADDENDUM
To AAM Record of October 12, 2004

Assessment Methods by Targeted Effect
Draft 2

I. Effect of change from Math 080 (3 contact hours) to MAT* G094 (4 contact hours)

- Obtain grade distributions for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 <u>by semester</u> for five semesters – F02,S03,F03,S04,F04.
- Obtain <u>cumulative</u> grade distributions for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 for the semesters – F02,S03,F03,S04,F04.
- Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semeter) for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 <u>by semester</u> for five semesters – F02,S03,F03,S04,F04.
- Obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 for five semesters – F02,S03,F03,S04,F04.

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- Beginning with Spring 05, and going forward semester-by-semester, Obtain grade distributions for *Intermediate Algebra* (MAT* G137) students who took Math 094 <u>by semester</u>.
- Beginning with Spring 05, and going forward, Obtain <u>cumulative</u> grade distributions for *Intermediate Algebra* (MAT* G137) students who took MAT* G094.
- Beginning with Spring 05 and going forward semester-by-semester, Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semester) for *Intermediate Algebra* (MAT* G137) students who took MAT* G094 <u>by semester</u>.
- Beginning with Spring 05 and going forward semester-by-semester, obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Intermediate Algebra* (MAT* G137) students who took MAT* G094.

II. Effect of placing greater emphasis on graphing, linear equations, and slope in MAT* G094.

- Ask each MAT* G094 instructor to place graphing/slope related questions in final examination core of MAT*G094 beginning with F04 as follows:
    a) Follow established procedure of inviting each MAT* G094 instructor to submit between 5 and 10 questions from which the AAM Group will assemble a universe, U, of questions from which each instructor will select a subset, S, of n questions for inclusion on his/her final examination.
    b) The set S will be include a subset, G, of m graphing/slope questions.
    c) The set, G, would appear on a single page, the last would be simplest, of each final examination. On the page containing, G, neither student's name nor instructor's name would appear.
    d) Each instructor, would copy the page containing G and anonymously relative to both instructor and student place the set of copies in some designated secure mailbox.
    e) Members of AAM would assess the students' work on G and begin to assemble pertinent statistics.

Application of Assessment to Mathematics (AAM) Group
Record of Meeting
Tuesday, October 26, 2004 at 3:00 p.m.

<u>Members Present</u>: P. Duncan, A. Freeman, L. Carmona, P. Wursthorn

The AAM Group agreed to bring the proposed methods for assessing the effects of several recent changes in the mathematics curriculum to the S&M Department meeting for its action on October 28, 2004. It was agreed that different, but equivalent, "supersets" of core questions would be distributed for Tuesday/Thursday and Monday/Wednesday classes.

The AAM Group recommended that a meeting of all Mathematics faculty, full and part-time, be scheduled at the beginning of the 2005 Spring Semester. A. Freeman agreed to explore the possibility of coordinating this meeting with the beginning-of-semester orientation meeting for all adjunct faculty. P.Wursthorn said that he would explore the possibility of stipends for the adjunct faculty who attended such a meeting.

P. Duncan, with support from the AAM Group, indicated that he would introduce the idea of cooperating with the Hartford Public School System under the aegis of a "no-child-left-behind" grant to the S&M Department at its October 28th meeting.

AAM Group members agreed to review and modify as needed the Core letters that P.Wursthorn would prepare for distribution to MAT* G094 and MAT* G137 instructors.

K.Herron had sent suggestions to the AAM Group relative to its assessment efforts. One of these involved a survey of all *Introductory Algebra* instructors to determine how they think the course is going, and, in particular, to elicit their views concerning the content and extended time for the course. AAM Group members supported the idea of conducting such a survey and they offered suggestions that P.Wursthorn will incorporate into a first draft. The following is a preliminary first draft.

The number of semester hours for *Introductory Algebra*- MAT* G137 is 4 rather than the 3 hours that were available to its predecessor, *Basic Algebra*-Math 080.
- Have you found 4 semester hours useful?
- How would you rank the change from 3 hours to 4 hours on a one to five scale from no discernible benefit to student learning to highly beneficial to student learning ?
- Do you have any suggestions for structuring class time or configuring class activities in order to sustain student attention and interest?

Attached to this record are proposed assessment methods that will be presented at the S&M October 28th meeting. At that time, the Group will finalize the core question sets.

The next meeting of the AAM Group is scheduled for Tuesday, November 16, 2004 in the Lobby on the ninth floor at 3:00 pm. If an earlier meeting is needed, it was agreed that P.Wursthorn would call such a meeting.

Recorded by: Peter A. Wursthorn
pc: L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, P. Duncan, J.Wang,
C. McMahon - S&M Chair

ADDENDUM
To AAM Record of October 26, 2004

Assessment Methods by Targeted Effect

I. **Effect of change from Math 080 (3 contact hours) to MAT* G094 (4 contact hours)**

- Obtain grade distributions for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 by semester for five semesters – F02,S03,F03,S04,F04.
- Obtain cumulative grade distributions for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 for the semesters – F02,S03,F03,S04,F04.
- Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semeter) for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 by semester for five semesters – F02,S03,F03,S04,F04.
- Obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Intermediate Algebra* (Math 131 and MAT* G137) students who took Math 080 for five semesters – F02,S03,F03,S04,F04.

- Beginning with Spring 05, and going forward semester-by-semester, Obtain grade distributions for *Intermediate Algebra* (MAT* G137) students who took Math 094 by semester.
- Beginning with Spring 05, and going forward, Obtain cumulative grade distributions for *Intermediate Algebra* (MAT* G137) students who took MAT* G094.
- Beginning with Spring 05 and going forward semester-by-semester, Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semester) for *Intermediate Algebra* (MAT* G137) students who took MAT* G094 by semester.
- Beginning with Spring 05 and going forward semester-by-semester, obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Intermediate Algebra* (MAT* G137) students who took MAT* G094.

II. Effect of placing greater emphasis on graphing, linear equations, and slope in MAT* G094.

- Ask each MAT* G094 instructor to place graphing/slope related questions in final examination core of MAT*G094 beginning with F04 as follows:

a) Follow established procedure of inviting each MAT* G094 instructor to submit between 5 and 10 questions from which the AAM Group will assemble a universe, *U*, of questions from which each instructor will select a subset, *S*, of *n* questions for inclusion on his/her final examination.

b) The set *S* will be include a subset, *G*, of *m* graphing/slope questions.

c) The set, *G*, would appear on a single page, the last would be simplest, of each final examination. On the page containing, *G*, neither student's name nor instructor's name would appear.

d) Each instructor, would copy the page containing *G* and anonymously relative to both instructor and student place the set of copies in some designated secure mailbox.

e) Members of AAM would assess the students' work on *G* and begin to assemble pertinent statistics.

III. Effect of curriculum modifications in MAT* G075, MAT* G094, and MAT* G137 on precalculus students.

- Obtain grade distributions for *Precalculus* (Math 133 and MAT* G186) students who took Math 131 <u>by semester</u> for five semesters – F02,S03,F03,S04,F04.

- Obtain <u>cumulative</u> grade distributions for *Precalculus* (Math 133 and MAT* G186) students who took Math 131 for the semesters – F02,S03,F03,S04,F04.

- Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semeter) for *Precalculus* (Math 133 and MAT* G186) students who took Math 131 <u>by semester</u> for five semesters – F02,S03,F03,S04,F04.

- Obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Precalculus* (Math 133 and MAT* G186) students who took Math 131 for five semesters – F02,S03,F03,S04,F04.

- Beginning with Spring 05, and going forward semester-by-semester, Obtain grade distributions for *Precalculus* (MAT* G186) students who took MAT* G137 <u>by semester</u>.

- Beginning with Spring 05, and going forward, Obtain <u>cumulative</u> grade distributions for *Precalculus* (MAT* G186) students who took MAT* G137.

- Beginning with Spring 05 and going forward semester-by-semester, Obtain success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees each semester) for *Precalculus* (MAT* G186) students who took MAT* G137 <u>by semester</u>.

- Beginning with Spring 05 and going forward semester-by-semester, obtain cumulative success rate (= Sum of As,A-s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees) for *Precalculus* (MAT* G186) students who took MAT* G137.

IV. Effect of changing the prerequisite for *Probability and Statistics* (MATH 124)

{*Statistics with Technology* (MAT 167) as of Fall 04} from *Basic Algebra* (Math 080)
{*Introductory Algebra* (MAT 094) as of Fall 04} to *Intermediate Algebra* (MATH 131)
{*Intermediate Algebra* (MAT 137) as of Fall 04}.
Note: For simplicity, in the following, both statistics courses will be referred to as
Statistics and both intermediate algebra courses will be referred to as *Intermediate
Algebra*.

- For each semester beginning with Fall 2002, divide students who have taken
  Statistics into two groups as follows.

  Group-A: Students who successfully completed *Intermediate Algebra* at CCC
  before taking *Statistics* or who placement tested out of *Intermediate Algebra*.

  Group-B: Students who took *Statistics* without having previously taken
  Intermediate Algebra at CCC or students who took the placement test but did not
  place out of *Intermediate Algebra*.

  Note: The union of the above two groups may not include all students who took
  Statistics. It does not include students who did not take the placement test and
  who took *Statistics* without previously taking *Intermediate Algebra*.

- Obtain grade distributions for *Statistics* (Math 124 and MAT* G167) for **Group-
  A and Group-B** for five semesters – F02,S03,F03,S04,F04.
- Obtain cumulative grade distributions for *Statistics* (Math 124 and MAT* G167)
  for **Group-A and Group-B** for the five semesters – F02,S03,F03,S04,F04.
- Obtain success rates for **Group-A and Group-B** (= Sum of As,A-s,B+s,Bs,B-
  s,C+s,Cs C-s divided by total number of enrollees in each group) (Math 124 and
  MAT* G167) by semester for five semesters – F02,S03,F03,S04,F04.
- Obtain cumulative success rates for **Group-A and Group-B** (= Sum of As,A-
  s,B+s,Bs,B-s,C+s,Cs,C-s divided by total number of enrollees in each group) for
  Statistics (Math 124 and MAT* G167) for five semesters – F02,S03,F03,S04,F04.
- Compare the statistics obtained for **Group-A and Group-B** in the four preceding
  bulleted items.

V. Effect of increase in semester hours from 3 to 4 for MAT* G094.

Survey of MAT* G094 as described in the AAM Record of October 26, 2004. This
survey is now being developed and will be administered in December 2004.

VI. Effect of greater emphasis on linkage between MAT* G094 and Chemistry –
Scientific notation, SI, conversions between units.

This assessment cannot begin before S05. Consultation with chemistry professors, Dr.
Frost and Dr. Mühlmann, would be useful.

VII. Other effects to be assessed?

Application of Assessment to Mathematics (AAM) Group
Record of
Meeting -- Tuesday, November 16, 2004 at 3:00 p.m.
and of
Related Activities During the Week of November 15, 2004

Members Present: A. Freeman, L. Carmona, P. Wursthorn

The AAM Group assembled from the "candidate" core exercises submitted by MAT 094 instructors two sets of 7 questions each, one for M/W classes and the other for T/R classes. From this set of 7 questions, each MAT 094 instructor will select 5 questions to form the core of his/her final examination. In addition, the AAM Group assembled from the "candidate" graphing/linear equation/slope exercises submitted by MAT 094 instructors two sets of 4 questions each, one for M/W classes and the other for T/R classes. From this set of 4 questions, each MAT 094 instructor will select 2 questions to form the "graphing/linear equation/slope" section of his/her examination. For assessment purposes, each instructor will submit copies of his/her students' work on the "graphing/linear equation/slope" section without names of instructors or students to the AAM Group via P.Wursthorn's mailbox.

On Wednesday November 17, 2004, A. Freeman, L. Carmona, and P. Wursthorn met to assemble from the "candidate" core exercises submitted by MAT 137 instructors two sets of 8 questions each, one for M/W classes and the other for T/R classes. From this set of 8 questions, each MAT 137 instructor will select 5 questions to form the core of his/her final examination.

L. Carmona and A,.Freeman assumed responsibility for the logistics of preparing and distributing the MAT 137 exercise sets. P.Wursthorn assumed similar responsibility for the MAT 094 exercise sets. All exercise sets were distributed to the instructors no later than Friday, November 19, 2004

The MAT 094 survey has been completed and it will be distributed to MAT 094 instructors after the Thanksgiving vacation.

The next meeting of the AAM Group is scheduled for Tuesday, November 30, 2004 in the Lobby on the ninth floor at 3:00 pm.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, C. McMahon - S&M Chair

- VI -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, November 30, 2004 at 3:00 p.m.

<u>Members Present</u>: A. Freeman, L. Carmona, P. Wursthorn

P. Wursthorn reported that the assessment survey form for MAT-094 instructors was distributed on November 30th with a requested return date of Thursday, December 9th. He also reported that relative to assessment of the effects of changes in the mathematics curriculum, he had met with M.Thornton and K. Simonds and that K. Simonds had indicated that he would provide support for the assessment effort.

A. Freeman asked for ideas relative to increasing the level of required writing in mathematics and science courses and for the type of support required to advance such an effort. L. Carmona suggested that it would be worthwhile to examine the relationship between writing required for science laboratory reports and writing requirements that might be incorporated in mathematics courses. It was observed that in some sections of mathematics courses out-of-class projects are assigned that require written expression. It was noted that the writing expectations for such projects typically demand a written presentation that includes a statement of purpose, description of any pertinent experiment, data, tables, graphs, and mathematical objects and that such a presentation conveys a coherent development of ideas from beginning to end. The writing criteria for such projects may differ in some respects from those applied in an English composition class; the commonality and differences in such criteria needs to be explored. The AAM recognizes that the College should provide some form of institutional support for any effort to meaningfully increase writing in mathematics courses.

P. Wursthorn indicated that he would speak with K. Simonds and J. Wang relative to moving forward on each of the assessment activities described in the AAM Record of October 12, 2004.

It was agreed that the Institution-wide adjunct orientation meeting, scheduled for Thursday, January 20, 2005 from 5:30 to 7:30 pm, should include break-out sessions by discipline from 6:45 to 7:30. Full time mathematics faculty would be invited to participate is these break-out sessions. The AAM Group would take responsibility for setting up an conducting the mathematics break-out session. It was noted that such break-out sessions would provide an extremely important channel of communication. P. Wursthorn will submit this proposal at the S&M Department meeting on December 1, 2004 for its action. If approved by the S&M Department, the proposal should be forwarded to both the Academic Dean and the CCC Advisory Committee in Support of the Center of Teaching.

Relative to preparing for the mathematics break-out session the AAM will provide a list of items that it wishes to communicate to adjunct faculty such as:
- S&M Department expectations delivered by the S&M Chair
- The requirement to use technology in certain courses
- A list of TI-83 functions that are available for use in *Statistics with Tedchnology*
- A list of learning technologies available in the Math Center
- Math Center resources
- Best in-class use of Tutor-Liaison time
- Up-to-date Course Outlines
- Curriculum requirements of the new course, MAT 094

The AAM discussed the benefit of the obtaining the computer algebra system, MAPLE™, and will submit a motion to do so at the S&M Dept.meeting of December 1, 2004. The proposal is to purchase 15 copies of the software – ten student versions and five faculty versions.

P. Wursthorn stated that he will make copies of the MAT 094 Survey and distribute them to members of the AAM Group each of whom has volunteered to draw conclusions from it and forward those conclusions via email to P.Wursthorn, who will assemble them into a report.

Also, the AAM Group agreed to prepare for the Adjunct Orientation mathematics break-out session through interchange of emails. P. Wursthorn's home email address is pawur@ntplx.net.

P. Wursthorn anticipates receiving from all MAT 094 instructors the student work on the graphing/slope/linear equation section of their final examinations. The AAM Group, with assistance from L. Marino, will begin evaluating the level of student accomplishment in that area at the beginning of the Spring 2005 Semester.

The next meeting of the AAM Group is scheduled for Tuesday, February 1, 2005 in the Lobby on the ninth floor at 3:00 pm.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, C. McMahon - S&M Chair

- VII -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, February 1, 2005 at 3:00 p.m.

Members Present: A. Freeman, L. Carmona, P. Wursthorn, L.Marino
Guest: M. Maccarone Brophy

M. Brophy briefed the AAM Group relative to the Tech Prep Program as follows:
- She Explained Tech-Prep structure and policies.
- CCC has Tech Prep agreements with 13 secondary schools in the area.
- Each semester approximately 700 students are enrolled in the CCC Tech Prep Program
- She has initiated the process of reviewing the content of high school courses for which CCC awards credit through the Tech Prep Program.
- A means for reviewing the content of CCC Tech Prep high school courses is needed.

Subsequent discussion raised the following issues:
- A process is needed for easily and rapidly obtaining a list of all students who are awarded CCC credit for Tech Prep courses.
- A process is needed for easily and rapidly obtaining a list of all students who enroll at CCC and apply Tech Prep credits to fulfill CCC curriculum requirements.
- For placement testing purposes, it is important to know whether incoming students have Tech Prep credits to apply toward the fulfillment of CCC curriculum requirements.

It was agreed that a meeting of CCC math faculty and representatives of the mathematics departments of CCC Tech Prep associated high schools would be beneficial.

The next meeting of the AAM Group is scheduled for Tuesday, February 15, 2005 in the Lobby on the ninth floor at 3:00 pm. At this meeting the AAM Group will set up a plan for reviewing the Tech Prep courses for which MAT* G137 credit is awarded, and it will start the process of obtaining information from the data collected about MAT* G094 in the 2004 Fall Semester.

Recorded by:
Peter A. Wursthorn
pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

- VIII -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, February 15, 2005 at 3:00 p.m.

Members Present: A. Freeman, L. Carmona, P. Wursthorn,
Guest: M. Maccarone Brophy

The AAM Group finalized a procedure for assessing the degree of concordance between high school Algebra II courses and CCC's *Intermediate Algebra* – MAT 137. M. Brophy distributed descriptions of the Algebra II courses from most of the 13 high schools that have TECH PREP agreements with CCC. It was agreed that A. Freeman, L. Carmona, and P. Wursthorn would review each of the descriptions from all the high schools and then compile their individual assessments into a single assessment for each high school. [Note: L. Marino informed P. Wursthorn that she would assist in case additional work is needed to achieve a decision (tie break) for any particular high school.] M. Brophy circulated a form for recording the results as well as any concerns relative to the assessments. A. Freeman, L. Carmona, and P. Wursthorn agreed to review a subset of Algebra II descriptions and to exchange them for another subset on Tuesday, February 22, 2005 at 3:00 pm. The AAM Group agreed on April 1, 2005 as the deadline for completion of the preliminary assessment.

M .Brophy indicated that she will proceed to organize the planned MATH = LINK Tech-Prep symposium for April 26, 2005. This will be a meeting of CCC math faculty and representatives of the mathematics departments of CCC Tech Prep associated high schools.

The AAM Group agreed to review P. Wursthorn's preliminary compilation of conclusions from the MAT–094 survey and to report back any needed additions or changes at the next AAM meeting.

P. Wursthorn agreed to organize the MAT-094 graphing assessment questions in preparation for carrying out the assessment of graphing related work by MAT–094 students

The next meeting of the AAM Group is scheduled for Tuesday, March 1, 2005 in the Lobby on the ninth floor at 3:00 pm. At this meeting the AAM Group will report progress on Tech-Prep course assessment and initiate the process of obtaining information from the data collected about MAT* G094 in the 2004 Fall Semester.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

- IX -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, March 1, 2005 at 3:00 p.m.

Members Present: A. Freeman, L. Carmona, P. Wursthorn,
Guest: M. Maccarone Brophy

AAM Group members reported that the process of assessing the degree of concordance between high school Algebra II courses and CCC's *Intermediate Algebra* – MAT 137 was on schedule. It was agreed that the Group members would complete their individual assessments by Tuesday, March 8, 2005 and that on that on that date they would meet to compile their findings into a single assessment for each high school.

The AAM Group agreed to continue reviewing the preliminary compilation of conclusions from the MAT–094 Instructor Survey and to report back any needed additions or changes at the next AAM meeting.

The AAM Group proceeded to develop a method for evaluating the work on graphing, linear equations, and slope done by MAT-094 students on their 2004 Fall Semester final examinations. The AAM Group identified six types of graphing/linear equations/slope questions (A through F), some of which had subparts to which relative values were assigned. It was agreed that each member of AAM would correct the questions for one of three mutually exclusive subsets of the categories, and report the number and percent of students who successfully completed the questions in each category. A. Freeman volunteered to write an evaluation rubric that reflected these understandings. The completion date for this assessment was set for April 19, 2005

In looking forward to the remainder of the 2005 Spring Semester, it was observed that in the near future the AAM Group will ask MAT-094 and MAT-137 instructors to submit questions for the final examination cores.

The next meeting of the AAM Group is scheduled for Tuesday, March 8, 2005 in the Lobby on the ninth floor at 3:00 pm. At this meeting, the AAM Group members will compile their individual TECH PREP degree-of-concordance findings into a single assessment for each high school.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

- X -
Application of Assessment to Mathematics (AAM) Group
Record
of
Meeting - Thursday, March 10, 2005 at 12:00 M

<u>Members Present</u>: A. Freeman, L. Carmona, P. Wursthorn,

AAM Group members reviewed their individual assessments of the degree of concordance between high school Algebra II courses and CCC's *Intermediate Algebra* – MAT 137, reached a consensus about the degree of concordance for each course, and compiled their findings into a preliminary assessment for each high school Algebra II course. Each preliminary assessment identified areas or topics about which further information is needed in order to make a fully informed decision about the degree of concordance.

Subsequent to the meeting, Michelle Brophy indicated that she will send the preliminary assessments to the high schools along with a course outline for MAT 137.

After the meeting,, on March 10th, A Freeman edited the in-progress degree-of-concordance findings, compiled them into a single document of preliminary assessments, and sent it to Michelle Brophy.

Recorded by:
Peter A. Wursthorn

<u>pc</u>: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

- XI -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Thursday, March 29, 2005 at 3:00 pm

<u>Members Present</u>: A. Freeman, L. Carmona, P. Wursthorn,
<u>Guest</u>: M. Maccarone Brophy

Michelle Brophy reported on the latest list of high school representatives who would be participating in the TECH-PREP symposium on Tuesday, April 26, 2005 at 2:45 pm. The AAM Group and M. Brophy then continued to develop plans for the symposium. The symposium will begin with a greeting and introductory remarks and then break into five subgroups, each led by a CCC faculty member. The plan is to ask L. Marino, P. Duncan, L. Carmona, A. Freeman, and P. Wursthorn to lead the subgroups. Each subgroup will address (1) concordance issues, (2) areas of concern, and if time permits (3) instructional/presentation approaches. The AAM, in cooperation with M. Brophy, will subsequently record the findings of the meeting in a summary of learned results. The AAM Group and M. Brophy will meet on Tuesday, April 19, 2005 to fine tune symposium plans.

The AAM Group proceeded to discuss its assessment of students' 2004 Semester work on graphing/slope/two-variable linear equations. As part of this process, L. Carmona noted that two additional question categories needed to be added to the list of assessment questions. A Freeman stated that he would add those categories to the assessment rubric and circulate the amended rubric to the AAM members. It was agreed that the AAM group would aim to complete the assessment on Tuesday, April 5, 2005 at 3:00 pm.

The next meeting of the AAM Group is scheduled for Tuesday, April 5, 2005 in the Lobby on the ninth floor at 3:00 pm. At this meeting, the AAM Group members will complete the assessment of students' 2004 Semester work on graphing/slope/linear equations, assure that the MAT-094 Instructor survey report is ready for distribution to all full and part-time faculty, and that the AAM has a plan for efficiently assembling the MAT-094 and MAT-137 core-question universes and the MAT-094 universe of questions for graphing/slope/linear equations.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

Recorded by:
Peter A. Wursthorn

- XII -
Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, April 5, 2005 at 3:00 pm

Members Present: L. Carmona, P. Wursthorn, (Note: A. Freeman was unable to attend because of a conflict with the Dean's Administrative Division meeting which he had to attend.)

The AAM meeting began by reviewing the rubric for assessing 2004 Fall-Semester, MAT-094 students' work on graphing/slope/two-variable linear equations. After discussion at a prior AAM meeting, A. Freeman had assembled the rubric. The rubric was approved. L. Carmona and P. Wursthorn then compiled the "percent of success" statistics that A. Freeman, L. Carmona, and P. Wursthorn had previously obtained from the students' work on graphing/slope/two-variable linear equations. This compilation was prepared for presentation to the S&M Dept. at its meeting on April 8, 2005.

The prefatory comments for the results of the MAT-094 Survey were also finalized in preparation for submitting it to the S&M Dept. meeting on April 8, 2005.

The next meeting of the AAM Group is scheduled for Tuesday, April 19, 2005 in the Lobby on the ninth floor at 3:00 pm. At this meeting, the AAM Group members will work with M. Brophy on final preparations for the Tech-Prep symposium. The CCC Math Group participants in the symposium are L. Marino, P. Duncan, A. Freeman, L. Carmona, and P. Wursthorn. Also the, the AAM Group will assemble the MAT-094 and

MAT-137 core-question universes and the MAT-094 universe of questions for graphing/slope/linear equations.

Recorded by:
Peter A. Wursthorn

pc: P. Duncan , L. Carmona, A. Freeman, K. Herron, J. Jascot, L. Marino, K. Simonds, M. Thornton, J.Wang, M. Brophy, C. McMahon - S&M Chair

Recorded by:
Peter A. Wursthorn

ADDENDUM:
TO: Carol McMahon, Chair of the Science and Mathematics Dept.
FROM: L. Carmona, A. Freeman, P. Wursthorn – Representing the AAM Group
DATE: April 7, 2005
RE: Results of (1) Survey of MAT –094 Instructors to assess the effect of changes in the
second level developmental mathematics course that were introduced in the 2004 Fall Semester. (2) Assessment of MAT-094 students performance on graphing/ slope/two-variable linear equations.

Attached are the above cited items based on data collected at or near the conclusion of the 2004 Fall Semester. The AAM recommends that these results be distributed to all full- and part- time mathematics faculty as well as to all S&M members.

Relative to Part I of the Survey of MAT-094 Instructors, it appears that from their perception, the move from 3 to 4 contact hours had a positive impact on both teaching and learning. One could argue that since the weighted mean of the ranks for learning was slightly less than that for teaching (3.83 vs. 4.0) it follows that instructors viewed the effect on teaching to be more beneficial than that for learning. However, upon looking more closely at the data, one sees that 3 instructors thought that the impact on student learning was very positive vs. 2 who thought the effect on teaching was very positive. Also, with the exception of one instructor who ranked the effect on learning as one (1), all others ranked the effect as 3 or better.

Based on the results of Part I, 3 and Part II, 4 it appears that instructors' perceptions vary regarding the extent to which maintaining students' attentiveness is a challenge. Also, there is evidence that specific learning activities help to maintain students' attentiveness during the class.

APPLICATION OF ASSESSMENT
TO
MATHEMATICS
(AAM)
GROUP

Record of Meetings
2005-2006

Application of Assessment to Mathematics (AAM) Group
Record of
Meeting - Tuesday, September 27, 2005 at 3:00 pm

Members Present: L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn

1. A. Freeman was unanimously elected Chair of AAM for the 2005 Fall Semester.
2. A. Freeman briefly described P. Duncan's idea for a revised curriculum that would involve streams of courses directed toward identified ends. A. Freeman indicated that perhaps we should consider establishing courses that would support subsequent study of actuarial science.

3. K. Herron moved that:
   The AAM (Application of Assessment to Mathematics) Group believes that the Math Center Coordinator position plays a very important part in helping students be successful in mathematics. Currently the Math Center Coordinator position is vacant due to Leonel Carmona accepting a full time instructor position. Since we moved to our downtown campus, enrollment is up considerably, and therefore the services are needed by even more students than they were three years ago. We believe it is vital that the new coordinator work full-time in this position, has a background in teaching mathematics and possesses administrative experience. Specifically we recommend the following qualifications for this position.

   > Bachelor's Degree in Mathematics (at a minimum)
   > At least one to three years of teaching mathematics at the community college level, and
   > Administrative experience.

   Motion was seconded and passed unanimously.

4. A. Freeman reported that Dean Affleck had asked him to lead an Achieving-the-Dream team charged with gathering information on developmental courses, improving the success rate of developmental courses, and forging stronger links between developmental and credit mathematics courses.

5. There was AAM group consensus on the need to review mathematics test placement cut-off scores, to compare them with scores used by other Connecticut State community colleges, and to examine them in light of recent changes in the mathematics curriculum, especially in MAT*-G094. Also, it was suggested that perhaps a cut-off score should be established for enrollment in MAT-075. In addition, it was noted that students should be encouraged to prepare for the placement test.

6. A. Freeman moved that the College provide resources for an adjunct mathematics faculty meeting at the beginning of each fall semester.

As part of the discussion relative to this motion, it was noted that if changes in the curriculum are to be effective and if students in a given course are to be prepared for its sequel, each instructor needs to cover the material (at the agreed level) in the relevant course outline and that this need can be best communicated at a meeting of all full-time and part-time mathematics faculty.

Motion was seconded and passed unanimously.

7. AAM will assess student work on graphing/slope/linear equations that was submitted in Spring 2005.

8. AAM will soon begin the process of preparing core questions for MAT-094 and MAT 137 final examinations for Fall 2005 as well as questions pertaining to assessment of student performance on graphing/slope/linear equations.

9. AAM will work with R. Pastino to complete the process of evaluating Tech-Prep courses.

Recorded by:
Peter A. Wursthorn

pc: L. Carmona, P. Duncan , A. Freeman, K. Herron, J. Jascot, L. Marino, J.Wang, C. McMahon - S&M Chair, R. Pastino – Coordinator of Tech-Prep

- II-
Application of Assessment to Mathematics (AAM) Group
Record
of
Meeting - Tuesday, October 18, 2005 at 3:00 pm

Members Present: L. Carmona, P. Duncan, A. Freeman, K. Herron, P. Wursthorn, Guest: R. Depastino

1. A. Freeman called the meeting to order.

2. R. Depastino, TECH PREP Coordinator, attended the AAM meeting with the purpose of developing a plan to complete the evaluation of the concordance of high school algebra II courses with Intermediate Algebra (MAT* G137). R. Depastino indicated that she would provide members of the AAM Group with copies of the TECH-PREP, math-pertinent documents on file in her office. {Note from Recorder: Subsequent to the AAM meeting, Renee indicated that after the Spring 2005 TECH-PREP Symposium, she had not received communications

from the high schools, with the exception of E. Hartford and the Technical High Schools (draft of an Algebra II curriculum)}

3. A. Freeman and K. Herron reported on a Basic Skills conference that they had attended on Friday November 14, 2005 at CCSU. K. Herron reported that one speaker at the Basic Skills conference cited statistics which showed the importance of requiring that high school students take mathematics courses during each of their four years in high school. The statistics indicated that students who took four years of high school mathematics did better in their college mathematics courses than honor students who took only three years of high school mathematics. Also, K. Herron reported that one speaker at the Basic Skills meeting held that it would be beneficial to move students directly into credit-bearing mathematics courses and reduce the number of students enrolled in developmental courses. A. Freeman reported that a recommendation or key idea of the conference was to align high school and college mathematics courses by establishing the same credit-bearing, entry-level algebra course at all colleges, public and private, in Connecticut. The goal of aligning the mathematics curricula of high schools and colleges is to avoid developmental courses and to have students take credit-bearing, college-level mathematics courses as their first college mathematics courses.

4. P. Duncan presented an idea for a revised curriculum that would involve creating more transitions and more filler courses between the ones that we now have. In particular, he emphasized such a role for a new college algebra course and noted that currently too many students are unprepared to move from Intermediate Algebra to Precalculus. After lengthy discussion, it was agreed that the AAM Group would research the "Maryland curriculum model" to determine whether and to what extend it might be applied in the CCC setting.

5. P. Wursthorn indicated that he would set in motion the process for assessing Spring 2005 student work on graphing/slope/linear equations.

6. Meeting adjourned at approximately 4:30 PM

Recorded by:
Peter A. Wursthorn

pc: L. Carmona, P. Duncan , A. Freeman, K. Herron, J. Jascot, L. Marino, J.Wang, C. McMahon - S&M Chair, R. Pastino – Coordinator of Tech-Prep

- III -
Application of Assessment to Mathematics (AAM) Group
Record
of
Meeting – Tuesday, November 1, 2005 at 3:00 pm

Members Present: L. Carmona, A. Freeman, K. Herron, P. Wursthorn,

C. A. Freeman called the meeting to order.

D. The AAM expressed its concern about preserving the integrity and high quality of services delivered by the Math Center relative to prospective structural changes that may affect that academic support area.

6. A. Freeman described some concerns of the System-wide math issues committee, particularly with respect to MAT 167. UCONN accepts Statistics from some community colleges but not others. UCONN's acceptance may require use of computer software. The Math Issues committee will send representatives to UCONN for clarification. Also, the word "technology" should be removed from the statistics course title.

7. A. Freeman plans to offer a MAPLE™ demonstration for interested faculty.

8. A. Freeman introduced the idea of making adjustments in the Accuplacer cut-off scores.

9. L. Carmona suggested designing an arithmetic course for students with the lowest cut-off scores.

10. The AAM group agreed on a plan for creating core final examination questions for MAT 094 and MAT 137 as well as assessment questions for linear equations in two variables, graphing and slope.

11. Meeting adjourned at approximately 4:30 PM

12. {NOTE by Recorder: Next meeting is scheduled for Tuesday, November 22, 2005.}
Recorded by:
Peter A. Wursthorn

pc: L. Carmona, P. Duncan , A. Freeman, K. Herron, J. Jascot, L. Marino, J.Wang, C. McMahon – S&M Chair

- IV -
Application of Assessment to Mathematics (AAM) Group
Record
of
Meeting - Tuesday, November 22, 2005 at 3:00 pm

<u>Members Present</u>: L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn,

1. A. Freeman called the meeting to order.

2. The AAM Group reviewed questions that instructors submitted for the universe of core questions for the MAT-094 and MAT-137 final examinations as well as questions submitted for assessment of MAT-094 student learning regarding graphing, linear equations in two variables, and slope. From the questions submitted, the AAM Group assembled universes of core questions for each of the foregoing categories – one set of universes for Tuesday/Thursday/Saturday classes, another for Monday/Wednesday classes. These universes of questions will be distributed to pertinent instructors on Monday, November 28, 2005.

3. Meeting adjourned at approximately 5:00 pm.

4. {NOTE by Recorder: Date of next meeting to be announced.}

Recorded by:
Peter A. Wursthorn

<u>pc</u>: L. Carmona, P. Duncan , A. Freeman, K. Herron, J. Jascot, L. Marino, J.Wang, C. McMahon - S&M Chair

Application of Assessment to Mathematics (AAM) Group
Minutes of the February 13th, 2006 Meeting

Members Present: Leonel Carmona, Andre Freeman, Kathy Herron, Peter Wursthorn
Guests Present: Renne DePaustino

Tech Prep

The AAM group expressed an interest in reestablishing contact with the Tech Prep liaisons at each High School for which Capital has an articulation agreement. AAM promised to deliver to Renee the updated information for each high school from the April 2005 symposium. May 1, 2006 was designated the date that AAM wished to declare concordance (or lack of) for each high school.

Renee stated that the Tech Prep enrollment for this semester is low. Certain schools are hesitant to promote Tech Prep due to the articulation agreements not being finalized. In addition, certain teachers are enrolling select students in their Algebra II classes in Tech Prep, giving them supplemental instruction to receive the Tech Prep credit, while the majority of students in the same class are not enrolled in Tech Prep and not receiving Tech Prep credit.

New Mathematics Assessments

A. Freeman proposed designing and implementing a new assessment model for the Math 075, Math 094, and Math 137 course sequence. The model consisted of a required exit exam (final exam) for each course which would be created and graded by a committee of math faculty. Each instructor would proctor the exam in their own class, and would send the exams to the grading committee, which would then send a spreadsheet with the students names and grades back to the instructor. The exam format would be multiple-choice, to allow the large set of exams to be graded in a timely manner. Members expressed concerns about the feasibility of such a policy and the inherent problems in the multiple choice format.

To assess the retention rates in the developmental sequence, P. Wursthorn proposed tracking a sample of 100 students in Math 075, semester by semester, to identify reasons that students are unable to complete the developmental sequence.

AAM discussed another assessment model for the Math 075, Math 094, and Math 137 course sequence. Each instructor would be required to place on their final exam a set of questions, created my math faculty, that address the learning outcomes of the course. The instructor would send the answers (to the specific set of questions) of all students to AAM where a grading committee would grade the students answers and tabulate the results. Since there would be a large number of student answers to grade at the end of the semester, AAM is looking to identify possible financial support from the S & M department or Achieving the Dream initiative to compensate faculty for their time.

Respectfully submitted by Andre Freeman.

Application of Assessment to Mathematics (AAM) Group
Record of the February 23rd, 2006 Meeting

Members Present: L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn
Guests Present: R. DePaustino

- **Common Exam Questions**
  AAM discussed the type of common exam question assessments for the Spring 2006 semester. K. Herron proposed creating a 7 – 10 question set for each course, collecting the answers of all students, and then choosing a sample of the 7 – 10 questions to assess. The smaller set of answers would make the grading task more manageable.

- **Breakdown of Student Results based on Ethnicity**
  A. Freeman discussed the need to disaggregate the assessment data to identify comprehension rates for specific groups of students. The Achieving the Dream initiative focuses attention on student populations with below average course completion and graduation rates, specifically African-American and Latino students. AAM discussed constructing a distribution of the student ethnicities to visualize the percentage of students in Math 075, Math 094, and Math 137 in these ethnic groups.

- <u>Strategies for Increasing Student Success</u>
  AAM discussed the following possible strategies for the Fall 2006 semester:
  - Placement Test Preparation Sessions
  - Offering Math 075 and Math 094 back to back in a 14 week period for specific students who demonstrate an understanding of Math 075 course material but placed into Math 075
  - Faculty presenting workshops on specific course concepts throughout the semester for all students in a particular course. Examples include a Fractions workshop for all Math 075 students, or a Graphing Calculator workshop for all Math 137 students.
  - Mandatory Tutoring for all students in a course who perform low on a common assessment. The assessment would be given at the same time in all sections of a class, and students would be given incentives for receiving tutoring.
  - Creating content specific modules inside the Math Center for students to receive assistance. Areas would be set up so that students visiting these areas would work on specific course content.

- The AAM group discussed hosting a meeting for all Math Faculty in late April to communicate the goals of the Achieving the Dream initiative and the goals of the Science and Math department and to discuss the new assessments.

Respectfully Submitted, Andre Freeman.

- VII -
Application of Assessment to Mathematics (AAM) Group
Record of the March 2nd, 2006 Meeting

Members Present: L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn
Guests Present: C. McMahon

- Common Exam Questions
  AAM discussed the methodology for correcting the Spring 2006 common exam questions. Members proposed allowing each instructor to grade their own students' answers and submit the results to AAM. This format would require more work by each faculty member. To maintain the confidentiality of the students' work, AAM agreed to keep the results of the assessment but destroy the actual student answers. Members also discussed the need to have each students' Banner ID on their answer set so that the grading committee could disaggregate the results based on student ethnicity.

- AAM Proposals
  Attached is a document containing two AAM proposals that will be brought to the Science and Math Department's next meeting.

- <u>Name Change for MAT * 167 Statistics with Technology</u>
  AAM supported the proposed name change of MAT * 167 *Statistics with Technology* to *Principles of Statistics*. The Math Issues Committee was responsible for proposing the course name change and AAM will report our input to Math Issues.

Respectfully Submitted,
Andre Freeman

- VIII -
Application of Assessment to Mathematics (AAM) Group
Record of the March 9th, 2006 Meeting

Members: M. Basche L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn
Guests: R. DePaustino

- Strategies for Increasing Student Success in Math 075, Math 094, and Math 137

  AAM discussed various strategies for increasing student success in the Algebra course sequence to be implemented in the Fall 2006 semester. The strategies discussed will be used to complete objectives of the Achieving the Dream Initiative. AAM discussed the following strategies that will be incorporated into the Achieving the Dream grant proposal:

- o Faculty workshops (Adjunct and Full-time)
- o Tutor workshops led by Mathematics Faculty
- o Faculty Liaison for the Math Center
- o Embedded Tutors – Clarifying the role and responsibilities to optimize the use of embedded tutors.
- o Mastery Testing
- o Math Study Skills component for IDS 101
- o Course curriculum that incorporates more real-world applications, more group work, and manipulatives

Respectfully Submitted,
Andre Freeman

-IX -
Application of Assessment to Mathematics (AAM) Group
Record of the March 23rd, 2006 Meeting

Members: M. Basche L. Carmona, A. Freeman, K. Herron, L. Marino, P. Wursthorn

- **Name Change Process for Mathematics Courses**

  The Math Issues Committee proposed a name change process for all CCC colleges to utilize in the future. AAM proposed modifications to the proposed process. A. Freeman will report back to the Math Issues Committee with AAM's recommendations.

- **AAM Accountability**

  AAM expressed concern that as an integral part of the Science and Mathematics department, AAM must be accountable to the Science and Mathematics department. Members wanted AAM to ensure that all motions and proposals acted upon by AAM be brought to the Science and Math department for approval.

Respectfully Submitted,
Andre Freeman

- X -
APPLICATION OF ASSESSMENT TO MATHEMATICS (AAM) GROUP
Record of Meeting
April 4, 2006

Members Present: L. Carmona, M. Basche, A. Freeman, K. Herron, L. Marino, P. Wursthorn
Guests: R. Pastino

A. Freeman called the meeting to order at 10:45 A.M.

It was agreed that K. Herron, L. Carmona, and P.Wursthorn would assume responsibility for preparing first drafts of the final examination core-question sets for MAT-137, MAT-075, and MAT-094 respectively.

K. Herron introduced a discussion relative to what appears to be the increasing number of students who are not prepared for the developmental mathematics courses, in particular MAT-075. This led to the question of whether or not a placement test score can and should be used to identify students who are unprepared for MAT-075. This question was followed by another, "What can Achieving the Dream do to address this want of student preparation for MAT-075?" The AAM continued to discuss the wide range of problems facing our students. In this context, discussion yielded the following ideas:

- We need to look for other venues to help our students; it is not fair for our students to pay for another developmental mathematics course level because they do not have the basic math skills on which MAT-075 depends. We need to do an analysis of the placement scores. Also, we need to create more methods of assessment to get more significant data for all students enrolled in Algebra (G075, G094 and G137). Perhaps we can find the specific skills and concepts in which the students are deficient and provide mandatory workshops that will prepare them in these skills.

- We need to address the situation within the course; it is necessary to look at the placement test scores and understand the meaning of these scores. A possible way to address this kind of problem will be intervention by group advising.

- We need to make sure that when students select their mathematics classes they are totally prepared for the given subject in which they wish to register. Placement test results should be able to tell us which concepts and skills represent problems for our students. With the above information, we will be able to design supplemental instruction such as workshops and additional instruction that will help to solve these types problems.

- It was suggested that a supplemental laboratory be created for each developmental class. This model has shown promise in other institutions of higher education.

The AAM Group discussed the most effective ways of continuing and completing the Tech-Prep course-concordance review. R. DePastino stated that she would communicate with each of the pertinent high schools relative to completing the process of assuring that there is agreement between the high school and college Tech-Prep courses.

Respectfully submitted,
Co-recorded by: L. Carmona and P.Wursthorn

- XI -
Application of Assessment to Mathematics (AAM) Group
Record of the May 4th, 2006 Meeting

Members Present: Leonel Carmona, Andre Freeman, Kathy Herron, Lynn Marino, Peter Wursthorn

Learning Center

AAM members discussed the need for strengthening the relationship between math faculty and the math tutors in the learning center. A. Freeman proposed that a full-time math faculty work in the learning center during the Spring 2007 semester to provide tutor training and to assist the math tutors in engaging students and increasing student comprehension. In addition the math faculty member would research best practices in math tutoring and tutoring services. L. Carmona expressed an interest in working with the Learning Center if an appropriate schedule is created.

Spring 2006 Math Faculty Meeting

AAM members planned the agenda for the Spring 2006 Math Faculty Meeting scheduled for Monday May 8th. Members discussed the goals of the meeting and stated the importance of communicating the goals of AAM and of the Achieving the Dream initiative to all the participants.

Spring 2006 Common Exam Questions

K. Herron proposed that AAM members grade a sample of the common exam questions due to the large number of questions AAM anticipated receiving from Math 075, Math 094, and Math 137 instructors. The sampling would allow AAM to identify the specific course material which students found most challenging without making the grading process an overwhelming venture.

Respectfully submitted by Andre Freeman.

- XII -
Application of Assessment to Mathematics (AAM) Group
Record of the May 16th, 2006 Meeting

Members Present: Leonel Carmona, Andre Freeman, Kathy Herron, Lynn Marino, Peter Wursthorn

Withdrawal Policy

AAM members expressed a need for faculty to create and adhere to a consistent policy for assigning students the "N" administrative notation. P. Wursthorn suggested that the Curriculum and Planning Committee (CAP) create a subcommittee to construct a set of guidelines to promote a uniform administration of the "N" administrative notation.

Achieving the Dream

AAM discussed various strategies that math faculty will employ to increase the success rates of students in the algebra course sequence. Members discussed:

- Implementing a common "2nd week assessment" to identify students that may be under prepared and thus likely to not succeed in the course. The common assessments will be given in all sections and supplemental instruction would be offered to the "high-risk" students.
- Setting aside time (possibly 30 minutes per week) in Math 094 classes for students to work in groups while being assisted by the instructor and the embedded tutor.
- Encouraging students to complete more homework
- Improving student attendance
- Improving students' in-class behavior

Respectfully submitted by Andre Freeman.