Eastern West Virginia Community and Technical College
COURSE ASSESSMENT REPORT

Course Title and Number: MTH 123 Intermediate Algebra	**Academic Term and Year of Assessment Activity (Ex: Fall, 2014)** Fall 2014
Report Submitted By: Andrea Williams	**Number of Students Assessed:** 12
Date Report Submitted:	**Number of Sections Included:** 1
Course Delivery Format (list all modalities used in sections assessed. Ex: web based, VDL, traditional section, hybrid course, etc.): Traditional section	

Course Role in the Curriculum

Provide a description of the role the course serves in the curriculum (i.e. general education requirement, program technical core, restricted elective, etc.). Note all as appropriate.

MTH 123 Intermediate Algebra is a college-level general education elective. It is prerequisite to MTH 135 College Algebra. It is a requirement for several science and technical programs of study and a recommended elective for those transferring to a 4-year program when College Algebra will be required.

Assessment Methods

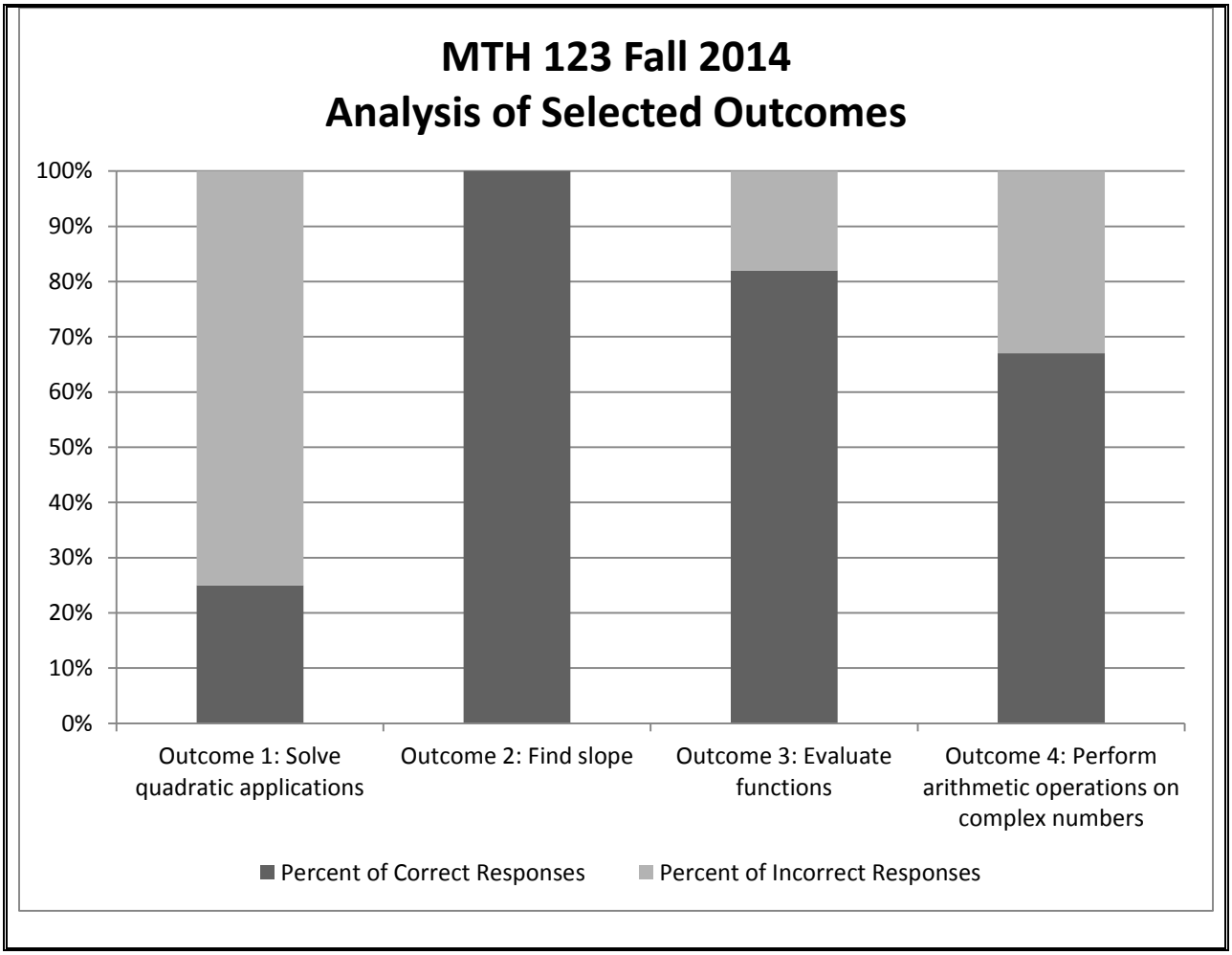
Provide a description of the assessment process used. Include description of instrument and performance standards in description. Note all methods.

Final exam questions are used as a basis for this assessment. The final was given through the online homework and assessment product Pearson's MyMathLab (as were all of the unit tests during the semester). The exam was given in two parts on two days. Each part of the exam was graded by MyMathLab but then checked by the instructor for partial credit based on the work students handed in. For purposes of this analysis, only questions receiving full credit are considered correct. Students were allowed to use a graphing calculator and a 3x5 index card of notes that they created. Students were given an optional (for extra credit) review assignment two weeks prior to the final exam with similar (but not the same) questions. Multiple questions may be included in one outcome for analysis. A minimum satisfactory percent of correct responses for each outcome is 75%. Those failing to meet the standard are reviewed on a question-by-question basis.

Assessment Results

Provide a summary of results including tables/charts. Incorporate information from previous assessments as appropriate. Append additional pages if necessary. If appending, include notation in box to "See attached".

Four outcomes were analyzed, and two out of the four met the 75% correct criterion. These results are similar to the results from the Spring 2013 assessment, but that assessment only included three students, so any comparisons made between the two classes may not be accurate. More details about the outcomes and the assessed questions are included in the action plan.



Course Level Assessment Summary of Outcomes, Indicators and Results **Course Title and Number: MTH 123 – Intermediate Algebra – Fall 2014** **Number of students in assessment sample = 12** **Number of Sections in Assessment = 1** **Add additional rows to table if necessary**				
Learning Outcomes (Insert learning outcomes assessed during this cycle)	**Indicator (Insert indicators used for each outcome: exam question, scoring rubric, etc. Be specific)**	**Percent of Correct Responses**	**Percent of Incorrect Responses**	**Performance Standard Met (75%)* (yes or no)**
Outcome 1: Solve quadratic applications	During the first part of a trip, a canoeist travels 18 miles at a certain speed. The canoeist travels 4 miles on the second part of the trip at a speed 5 mph slower. The total time for the trip is 3 hrs. What was the speed on each part of the trip? The number of tickets sold each day for an upcoming performance of	25%	75%	No

	Handel's Messiah is given by $N(x) = -0.4x^2 + 10.4x + 11$, where x is the number of days since the concert was first announced. When will daily ticket sales peak and how many tickets will be sold that day?			
Outcome 2: Find slope	Using the slope formula, find the slope of the line through the given points. (4,9) and (1,3)	100%	0%	Yes
Outcome 3: Evaluate functions	Find the function values for $f(n) = 3n^2 + 4n$. a) $f(0)$ b) $f(-4)$ c) $f(5)$ d) $f(s)$ e) $f(2a)$ f) $3 \cdot f(a)$ (Given a graph of a function) find $f(-1)$.	82%	18%	Yes
Outcome 4: Perform arithmetic operations on complex numbers	Multiply $(3 + 6i)(5 - 8i)$.	67%	33%	No

* Please note if using a different minimum performance standard.

Conclusions

Provide a brief summary of conclusions derived based on analysis of data. Append additional pages if necessary. If appending, include notation in box to "See attached".

This section of MTH 123 included a wide variety of ability levels coming into the course. Some placed into the course directly from high school, some started out in Basic Math here at Eastern, some placed into and successfully completed the accelerated MTH 99 here at Eastern, and some entered the course with either developmental or college-level math credit from another institution, but for the most part this was a hard-working, highly motivated group of students, and the course assessment and their final course grades reflect that. Although only two of the four assessed outcomes were met, a third only lacked one correct response from being mastered. The lowest scoring outcome at 25% is one that continues to be a stumbling block across semesters. The majority of this class will do fine in College Algebra if they chose to take it.

Previous Assessment Reports and Results

Date of Previous Assessment: Spring 2013

List of Outcomes Not Met: Solve quadratic applications, solve logarithmic equations

Summary of Actions Taken to Address Unmet Learning Outcomes: Append additional pages if necessary. If appending, include notation in box to "See attached".

Solve quadratic applications: Since only one student missed this outcome on the last assessment, no

specific action plan was given for improving this outcome. The students in the current section were reminded how to recognize a maximum/minimum problem, but clearly more emphasis needs to be placed on this (see Action Plan below).

The outcome to "solve logarithmic equations" was not even covered in this section due to time restrictions. Coverage of material will continue to be monitored to determine if too many outcomes are scheduled for this course.

The previous assessment also mentioned the need to continue to educate advisors on course placement. This has been done through discussions at advisor training and handouts included in the advisor handbook, and this will continue as we transition to the new developmental math courses in Fall 2015 (see Action Plan below).

Action Plan and Date for Reassessment

Identify action plan for improvement or maintaining current performance levels including outcomes identified for re-assessment, curriculum revision, LOT proposal, new or revised course activities to reinforce learning outcomes, etc. Append additional pages if necessary. If appending, include notation in box to "See attached".

Outcome 1: Solve quadratic applications
This outcome was not met on the previous course assessment and unfortunately was not mastered again. Two word problems were included on the final exam to address this outcome, one of which required setting up and solving a quadratic equation and one of which required finding the maximum of a quadratic function. The first question was a multiple-step motion problem which required first completing a table, applying the distance formula, applying substitution to a system of equations, and simplifying a rational equation, which then finally presented the students with a quadratic equation to solve. Three students had minor errors such as the wrong sign or a copy error, whereas nine of the students did not even complete the first step correctly. The two students who did get the correct answer actually found it by guessing and checking. The second problem required the students to recognize that it was a maximum problem and apply the appropriate formula. While four students did the problem correctly, the majority of the students did not even recognize what type of problem it was.

The problem with this outcome and any outcome involving applications in any course is that students put up a mental block when they run into word problems. They anticipate that they will be challenging and therefore many times do not even attempt to understand them, skipping over them on the homework and the unit test, knowing that the penalty will be minor as long as they understand the rest of the material in the unit fairly well. The other issue is that the section that covers applications is often the last one in the chapter or unit, leaving the students little time to seek extra help with them before a test. Unfortunately, the amount of material covered in this course does not allow for a day of review before each test, but perhaps the instructor could block off a time for review outside of class time; even 20-30 minutes before each test could be beneficial.

Additional actions to consider: Continue to emphasize the difference between the two types of quadratic applications and how to recognize a maximum/minimum problem. Consider including a different question on the final exam that focuses more on the outcome itself and does not involve as many steps.

Outcome 2: Find slope
This outcome was chosen because it was not met on the previous MTH 99 course assessment, and this

section of 123 included several students from that section of 99. Since 100% of the students answered this question correctly, no adjustment in instruction is recommended at this time. Continue to remind students of the formula during final exam review.

Outcome 3: Evaluate functions
Understanding the concept of a function and how to evaluate a function are imperative in mathematics. While overall this outcome was mastered, there is still room for improvement. The students did very well with the first question which required understanding function notation; the few mistakes that were made were mostly simple errors such as copying incorrectly or not putting the answer in the correct form. However, the second question, which required reading a graph to determine the function value, was only answered correctly by half of the students. It may be beneficial to assign more homework problems of this specific type and to make sure an example of this is covered during final exam review.

Outcome 4: Perform arithmetic operations on complex numbers
This is the lowest level math course at Eastern in which students encounter complex numbers, but many of them are somewhat familiar with them from high school, so this is not a hard outcome for them to master. Of the four students that had the answer incorrect, only one did not know how to approach the problem. The others were minor errors such as forgetting to combine like terms or forgetting to simplify by using the fact that $i^2 = -1$. By including a similar problem on the final exam review and reminding the students to simplify as much as possible, it should not be difficult to bring this outcome up to mastery level.

Student success in this course and mastery of outcomes will continue to be closely monitored due to recent changes to program requirements and ongoing changes in the developmental math courses. Effective with the 2014-2015 catalog, any student seeking an Associate of Arts degree is required to have either MTH 123 or MTH 225 as oppose to just MTH 121, thus potentially increasing the number of students taking MTH 123. Although the section this semester did not include any students that completed MTH 97, there will likely be some students in 123 over the next couple of semesters that have completed the modularized developmental math courses instead of the traditional developmental courses, followed by a cohort in Spring 2016 that have completed the new accelerated MTH 103 course, all of which will be taken into consideration in future assessments.

Proposed date for the next formal assessment is Fall 2016, although informal assessments will be conducted each semester to determine the impact of the developmental changes.

Assessment Committee Recommendation/Approval (To be posted by Assessment Committee Chair)
Approved as presented. **Date: March 25, 2015**

LOT Recommendation/Approval (To be posted by Assessment Committee Chair)
Ξ Approved as presented **Date: April 20, 2015**