Eastern West Virginia Community and Technical College
COURSE ASSESSMENT REPORT

Course Title and Number: MTH 121 College Math for General Education	**Academic Term and Year of Assessment Activity (Ex: Fall, 2014)** Spring 2015
Report Submitted By: Andrea Williams	**Number of Students Assessed:** 20
Date Report Submitted: May 26, 2015	**Number of Sections Included:** 2
Course Delivery Format (list all modalities used in sections assessed. Ex: web based, VDL, traditional section, hybrid course, etc.): One traditional section, one online 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 121 is a college-level general education elective. It serves as the mathematics requirement for most certificate and two-year degree students who need no further math for their program.

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 two sections were given different exams via different modalities, but the instructors collaborated prior to the exam about what questions would be included for purposes of this assessment. For the traditional section, the final was a paper exam given in two parts on two days. Students were allowed to use a scientific calculator. Due to extensive use of formulas and tables, the first part of the exam was open-note and open-book. The only aid the students had for Part 2 was a z-score table. Students were given partial credit based on the work they showed on their test paper, but for purposes of this analysis, only questions receiving full credit are considered correct. Students were given an optional (for extra credit) review assignment two weeks prior to the final exam with similar (but not the same) questions.

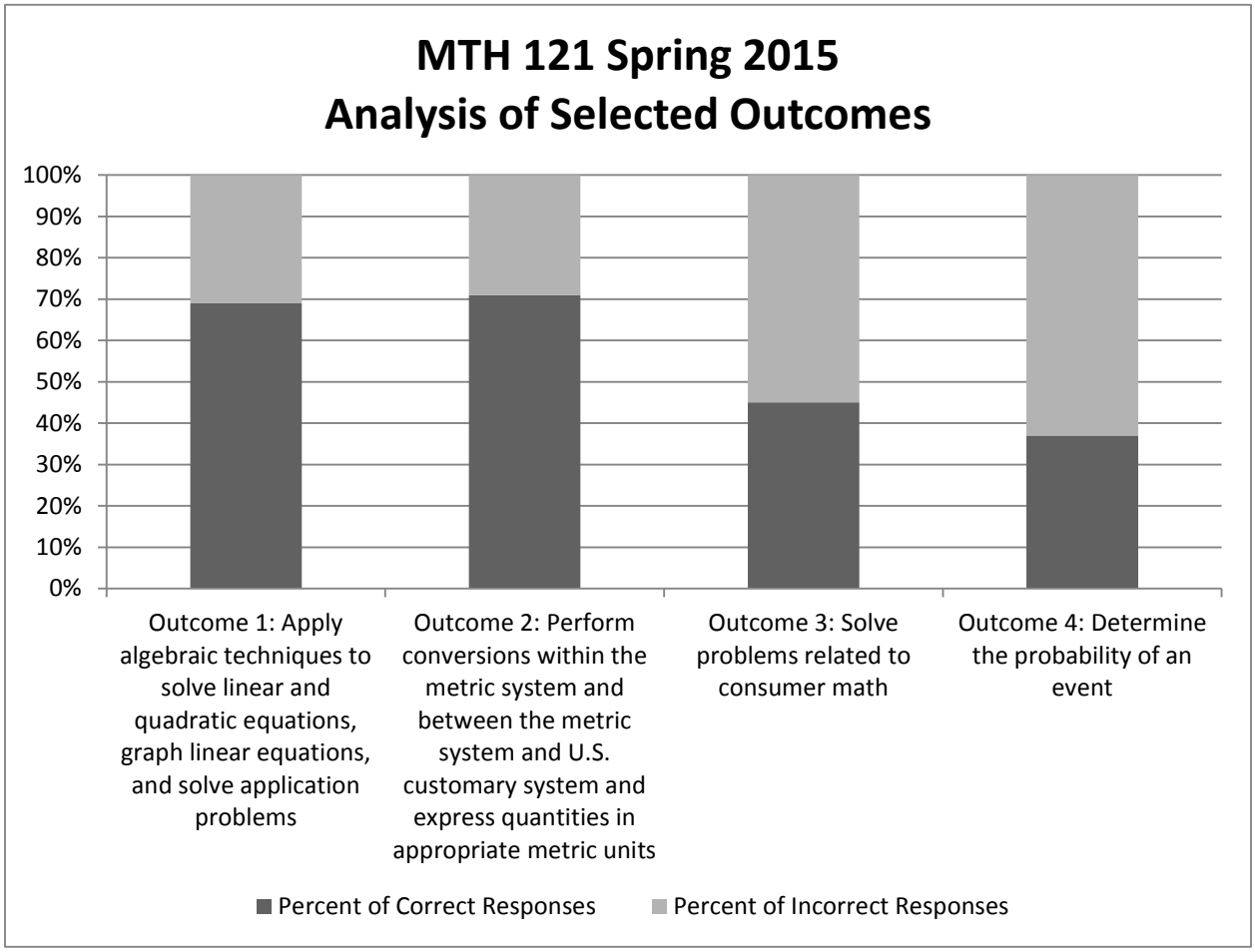
For the online section, the exam was given through the online homework and assessment product Pearson's MyMathLab (as were all of the unit tests during the semester) but was proctored in the Resource Center at Eastern's main campus.

Multiple questions are included in each outcome for analysis. A minimum satisfactory percent of correct responses for each outcome is 75%. Those failing to meet the standard are reviewed on an outcome-by-outcome 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 none out of the four met the 75% correct criterion. The results are similar to the results from the Spring 2013 assessment. 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 121 – College Math for General Education – Spring 2015** **Number of students in assessment sample = 20** **Number of Sections in Assessment = 2** **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: Apply	**2.4.** Evaluate $x^2 - 6x + 7$ when $x = 7$.	69%	31%	No

algebraic techniques to solve linear and quadratic equations, graph linear equations, and solve application problems	**2.5.** Solve the equation: $16(2x-1)=4(x+3)+2x$ **2.6.** Write an equation to represent "25 more than 6 times a number is the same as 4 less than 8 times the number." Then solve the equation. **2.7.** Solve $8x+7y=21$ for y. **2.8.** T varies directly as the square of D and inversely as F. Find T when $D=19$, $F=14$, and $k=9$. Leave your answer as a (simplified) improper fraction. **2.9.** Determine the slope of the line through the points (7, 8) and (9, -3). **2.10.** Graph the equation: $y=-4x-2$. **2.11.** Solve the equation $5x^2+29x=-36$ for x.			
Outcome 2: Perform conversions within the metric system and between the metric system and U.S. customary system and express quantities in appropriate metric units	**1.1.** Change 21.2 hg to g. **1.2.** An adult male is about how tall? a. 175 mm b. 175 m c. 175 cm **1.3.** The area of a television screen is about: a. 2913 m^2 b. 2913 mm^2 c. 2913 cm^2 **1.4.** You bought a bottle of juice at the store. The most reasonable measurement for its contents is a. 0.54 kL b. 0.54 L c. 0.54 mL **1.5.** The mass of a computer mouse is about how much? a. 200 g b. 200 mg c. 200 kg **1.6.** The distance from Chicago, Illinois, to	71%	29%	No

	Atlanta, Georgia, is about 717 mi. What is the distance in kilometers? Round to the nearest tenth if necessary. **1.7.** Change 55℃ to degrees Fahrenheit. Round to the nearest tenth if necessary.			
Outcome 3: Solve problems related to consumer math	**1.16.** Convert $\frac{1}{5}$% to a decimal. **1.17.** Karen borrowed $3500 from a bank for 6 months. Her friend Ms. Harris was cosigner of Karen's personal note. The bank collected $7\frac{1}{2}$% simple interest on the date of maturity. Determine the amount Karen repaid to the bank on the due date of the note. **1.18.** On May 1, you sign a $2000 note with simple interest of 4% with a maturity date of July 1. You make a partial payment of $1000 on June 1. How much will you owe on the date of maturity? **1.19.** Compute (a) the amount and (b) the compound interest on $5000 at 2% compounded quarterly for 4 years. **1.20.** A homeowner installed new kitchen cabinets and countertops for $6500. He paid 15% down and financed the balance with a 24-month fixed installment loan with an APR of 7.0%. Determine the monthly payment for the loan. **1.21.** Sarah took out a 48-month fixed installment loan of $17,000 to open a gift shop. She began making monthly payments of $423.05. Sarah's business does better than expected and instead of making her 12th payment, Sarah decides to repay her loan in full. How much interest will Sarah save? **1.22.** The Fritzes are buying a house that sells for $156,000. The bank is requiring a minimum down payment of 20%. To obtain a 40-year mortgage at 12.5% interest, they must pay 2 points at the time of closing. Find the cost of the 2 points. **1.23.** Sheila's gross monthly income is $3000. She has 16 remaining payments of	45%	55%	No

	$172 on a car. The taxes and insurance on the house are $80 per month. If Sheila's bank will approve a loan that has a total monthly mortgage payment of principal, interest, property taxes, and homeowner's insurance that is less than or equal to 28% of her adjusted monthly income, what maximum monthly payment of principal and interest does the bank's loan officer feel that Sheila can afford? **1.24.** Determine the monthly payments of principal and interest for a 15-year loan of $148,000 if the annual interest rate is 7.5%. **1.25.** Laura and Martin obtain a 25-year, $190,000 mortgage at 9.0% on a house selling for $210,000. Their monthly payment, including principal and interest, is $1596.00. How much of the total cost will be interest?			
Outcome 4: Determine the probability of an event	**2.12.** Each individual let of the word *Michigan* is place on a piece of paper, and all 8 pieces of paper are placed in a hat. If one letter is selected at random from the hat, find the probability that the letter *i* is selected. **2.13.** Consider a collection of envelopes consisting of 3 red envelopes, 1 blue envelope, 2 green envelopes, and 2 yellow envelopes. If two envelopes are selected at random, without replacement, determine the probability that both are yellow envelopes. **2.14.** One card is selected at random from a standard deck of 52 cards. What is the probability of drawing a diamond or a jack? **2.15.** Of the 51 plays attributed to a playwright, 17 are comedies, 16 are tragedies, and 18 are histories. If one play is selected at random, find the odds against selected a comedy. **2.16.** A person randomly selects one of four envelopes containing checks for $0, $3, $5, and $22. Before the person can select an envelope, he or she must pay $15 to play. Determine the person's expectation. **2.17.** Two dice are rolled. Determine the	37%	63%	No

	probability of rolling a sum of 5. (Hint: you may want to list the sample space.) **2.18.** Determine the probability of selecting a circle, given that an odd number is selected. 			

* Please note if using a different minimum performance standard.
+See Attachment 1 for further analysis of performance by question and by section.

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".

Despite including more questions in each outcome for assessment and including both the face-to-face and online sections in the assessment, the results did not show improvement over the assessment from two years ago. One possible reason for these results is the lowered prerequisite to take MTH 121. This is discussed further in the Action Plan.

Previous Assessment Reports and Results

Date of Previous Assessment: Spring 2013

List of Outcomes Not Met: Convert US system to metric system, solve simple interest problems, solve "and" probability problems

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

Convert US system to metric system: More examples have been added when this topic is covered in class.

Solve simple interest problem: Students have been reminded to read the questions carefully and make sure they give the answer for which it is asking (i.e. does it want just the interest or the total amount?).

Solve "and" probability problems: In previous semesters, an extra day has been allotted to the chapter on probability which have proven to be helpful. However, since we lost a class day to a holiday this past semester, the time spent on this chapter this semester was kept to a minimum. Students are continued to be reminded of how to recognize the different types of probability problems and which operation accompanies each one.

The previous assessment also recommended that a common final exam be given when more than one section of MTH 121 is taught in the same semester. While this was not done formally this semester, the two instructors did collaborate on which questions to include.

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: Apply algebraic techniques to solve linear and quadratic equations, graph linear equations, and solve application problems
Overall, the students did not do poorly on this outcome, only missing mastery by 6%. The lowest scoring questions under this outcome included solving a formula for a specified variable, solving a proportion problem, graphing a linear equation, and solving a quadratic equation. Extra in-class examples and extra homework problems will be given on these topics.

Outcome 2: Perform conversions within the metric system and between the metric system and U.S. customary system and express quantities in appropriate metric units
While still slightly below the desired mastery level, this outcome has shown much improvement over the last assessment. Whereas only 44% of the students correctly answered the conversion question (1.6) two years ago, 70% did this time. One student only missed the question because she did not round to the specified number of decimal places; if her response had been correct, 75% of the students would have had the question correct. The extra examples mentioned above in the Previous Assessment Reports and Results will continue to be covered in class.

The other questions with low scores under this outcome were the multiple choice questions asking the students to give a measurement in metric units (1.2, 1.3, 1.4). It will be ensured that the students are given similar questions in their homework and in the final exam review.

Outcome 3: Solve problems related to consumer math
This is an outcome that continues to be a challenge semester after semester for students. Both the unit test on this outcome and this part of the final exam are given as an open-note, open-book test due to the extensive number of formulas and tables the students must reference for this chapter. This may, however, be more detrimental than beneficial to the learning process. It will be considered in future semesters to make this a closed-note, closed-book test like the other chapters and just give the students the formulas and tables they need so that they will be more apt to study and better prepare for this test.

Outcome 4: Determine the probability of an event
As mentioned above in the Previous Assessment Reports and Results, not as much time was allotted to this outcome as desired. The students do seem to understand the material as we work through the chapter section-by-section; the issue is when the students are faced with questions from the entire chapter together on the unit test or the final exam: they have a hard time discerning the appropriate method for solving each problem. Having a class period devoted entirely to review and working on problems from this chapter in a random order is imperative. If a make-up day is needed in future semesters due to a holiday or snow day, it will be taken from a unit on which the students are more confident rather than this one.

To improve overall performance on the final exam, other alternatives will be considered for the final exam review assignment. As mentioned above, it is currently given as an extra credit assignment, but because it is optional, most students do not put as much time and effort into it as they should. In the future, this will likely be made a *required* assignment with enough weight towards their final grade to motivate the students to do well on it.

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, students are only required to have through MTH 94/95 (which will

transition to the new course MTH 101 in Fall 2015) instead of the entire developmental sequence to take MTH 121. The sections this semester included a variety of backgrounds: some students took no developmental; some students successfully completed both MTH 94/95 and 96/97 or MTH 99; some students attempted but were not successful at MTH 96 or 97; and some students only attempted through MTH 94 or 95. An analysis of the final course grade based on prerequisites can be found in Attachment 2. Overall, the lack of the second part of introductory algebra does not appear to have a significant impact on performance in MTH 121; however, this semester provided a small sample size, so this will continue to be monitored over multiple semesters. Also effective this school year, some students may take MTH 115 instead of 121 to fulfill their college-level math requirement, while 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 decreasing the number of students taking MTH 121.

Proposed date for the next formal assessment is Spring 2017, although informal assessments will be conducted each semester to determine the impact of the prerequisite and developmental changes.

Assessment Committee Recommendation/Approval (To be posted by Assessment Committee Chair)
✠ Approved as presented **Date: 09/09/15**

LOT Recommendation/Approval (To be posted by Assessment Committee Chair)
✠ Approved as presented **Date: 09/21/15**

Attachment 1: Performance by Question and by Section

Question	MTH 121-A11 (face-to-face section) Percent of Correct Responses	MTH 121-WB1 (online section) Percent of Correct Responses
2.4. Evaluate $x^2 - 6x + 7$ when $x = 7$.	100%	100%
2.5. Solve the equation: $16(2x - 1) = 4(x + 3) + 2x$	71%	Not on exam
2.6. Write an equation to represent "25 more than 6 times a number is the same as 4 less than 8 times the number." Then solve the equation.	71%	100%
2.7. Solve $8x + 7y = 21$ for y.	43%	62%
2.8. T varies directly as the square of D and inversely as F. Find T when $D = 19$, $F = 14$, and $k = 9$. Leave your answer as a (simplified) improper fraction.	29%	Not on exam
2.9. Determine the slope of the line through the points (7, 8) and (9, -3).	71%	Not on exam
2.10. Graph the equation: $y = -4x - 2$.	29%	Not on exam
2.11. Solve the equation $5x^2 + 29x = -36$ for x.	43%	Not on exam
1.1. Change 21.2 hg to g.	100%	Not on exam
1.2. An adult male is about how tall? a. 175 mm b. 175 m c. 175 cm	43%	Not on exam

1.3. The area of a television screen is about: a. 2913 m^2 b. 2913 mm^2 c. 2913 cm^2	57%	Not on exam
1.4. You bought a bottle of juice at the store. The most reasonable measurement for its contents is a. 0.54 kL b. 0.54 L c. 0.54 mL	57%	Not on exam
1.5. The mass of a computer mouse is about how much? a. 200 g b. 200 mg c. 200 kg	71%	Not on exam
1.6. The distance from Chicago, Illinois, to Atlanta, Georgia, is about 717 mi. What is the distance in kilometers? Round to the nearest tenth if necessary.	29%	92%
1.7. Change 55℃ to degrees Fahrenheit. Round to the nearest tenth if necessary.	100%	Not on exam
1.16. Convert $\frac{1}{5}\%$ to a decimal.	57%	100%
1.17. Karen borrowed $3500 from a bank for 6 months. Her friend Ms. Harris was cosigner of Karen's personal note. The bank collected $7\frac{1}{2}\%$ simple interest on the date of maturity. Determine the amount Karen repaid to the bank on the due date of the note.	71%	31%
1.18. On May 1, you sign a $2000 note with simple interest of 4% with a maturity date of July 1. You make a partial payment of $1000 on June 1. How much will you owe on the date of maturity?	57%	Not on exam
1.19. Compute (a) the amount and (b) the compound interest on $5000 at 2% compounded quarterly for 4 years.	43%	Not on exam

1.20. A homeowner installed new kitchen cabinets and countertops for $6500. He paid 15% down and financed the balance with a 24-month fixed installment loan with an APR of 7.0%. Determine the monthly payment for the loan.	14%	Not on exam
1.21. Sarah took out a 48-month fixed installment loan of $17,000 to open a gift shop. She began making monthly payments of $423.05. Sarah's business does better than expected and instead of making her 12^{th} payment, Sarah decides to repay her loan in full. How much interest will Sarah save?	29%	Not on exam
1.22. The Fritzes are buying a house that sells for $156,000. The bank is requiring a minimum down payment of 20%. To obtain a 40-year mortgage at 12.5% interest, they must pay 2 points at the time of closing. Find the cost of the 2 points.	43%	Not on exam
1.23. Sheila's gross monthly income is $3000. She has 16 remaining payments of $172 on a car. The taxes and insurance on the house are $80 per month. If Sheila's bank will approve a loan that has a total monthly mortgage payment of principal, interest, property taxes, and homeowner's insurance that is less than or equal to 28% of her adjusted monthly income, what maximum monthly payment of principal and interest does the bank's loan officer feel that Sheila can afford?	14%	Not on exam
1.24. Determine the monthly payments of principal and interest for a 15-year loan of $148,000 if the annual interest rate is 7.5%.	29%	Not on exam
1.25. Laura and Martin obtain a 25-year, $190,000 mortgage at 9.0% on a house selling for $210,000. Their monthly payment, including principal and interest, is $1596.00. How much of the total cost will be interest?	14%	Not on exam
2.12. Each individual let of the word *Michigan* is place on a piece of paper, and all 8 pieces of paper are placed in a hat. If one letter is selected at random from the hat, find the probability that the letter *i* is selected.	86%	Not on exam
2.13. Consider a collection of envelopes consisting of 3 red envelopes, 1 blue envelope, 2 green envelopes, and 2 yellow envelopes. If two envelopes are selected at random, without	29%	Not on exam

replacement, determine the probability that both are yellow envelopes.		
2.14. One card is selected at random from a standard deck of 52 cards. What is the probability of drawing a diamond or a jack?	43%	Not on exam
2.15. Of the 51 plays attributed to a playwright, 17 are comedies, 16 are tragedies, and 18 are histories. If one play is selected at random, find the odds against selected a comedy.	29%	Not on exam
2.16. A person randomly selects one of four envelopes containing checks for \$0, \$3, \$5, and \$22. Before the person can select an envelope, he or she must pay \$15 to play. Determine the person's expectation.	14%	Not on exam
2.17. Two dice are rolled. Determine the probability of rolling a sum of 5. (Hint: you may want to list the sample space.)	29%	23%
2.18. Determine the probability of selecting a circle, given that an odd number is selected. 	57%	Not on exam

Attachment 2: Analysis of MTH 121 Final Grades Based on Prerequisites

	Final Grade in MTH 121						
	A	**B**	**C**	**D**	**F/UF**	Total	**Average**
Students who took and passed MTH 96, 97, or 99	5	1	1	0	2	9	**2.78**
Students who took and passed MTH 96	1		1			2	**3.00**
Students who took and passed MTH 97	4	1				5	**3.80**
Students who took and passed MTH 99					2	2	**0.00**
Students who did not complete MTH 96 or 97	2	1	1	2	1	7	**2.14**
Students who took but did not pass MTH 96 or 97		1	1	1	1	4	**1.50**
Students who did not attempt MTH 96 or 97	2			1		3	**3.00**
Students who were not required to take any dev math courses	5	2	1		1	9	**3.11**
	12	4	3	2	4	25	**2.72**

A = 4.0
B = 3.0
C = 2.0
D = 1.0
F/UF = 0.0