

**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 2017
Report Submitted By: Andrea Williams	Number of Students Assessed: 10
Date Report Submitted: 5/24/2017	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	

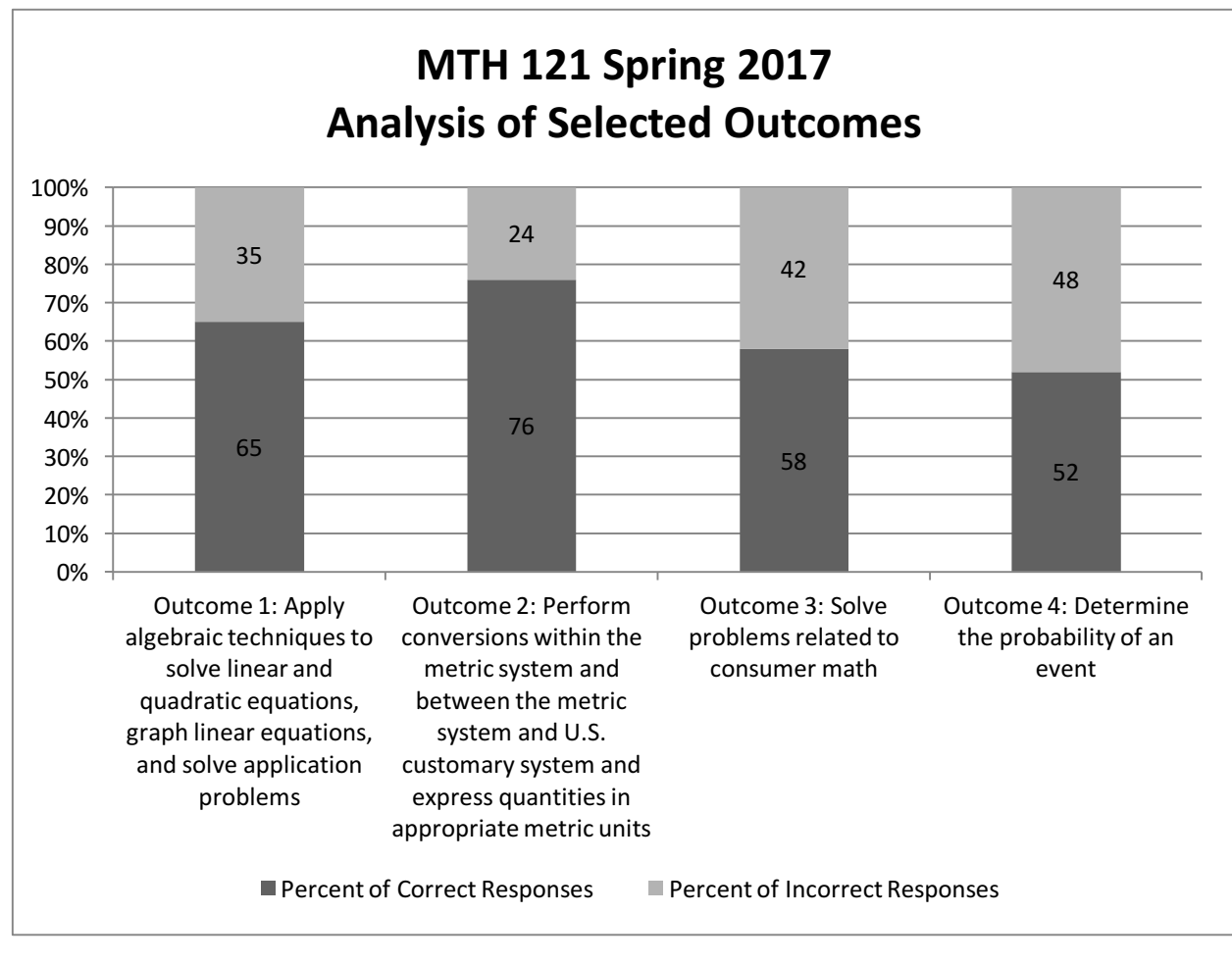
Course Role in the Curriculum
Provide a description of the role the course serves in the curriculum (i.e. general education requirement, program technical core, restricted elective, etc.). Note all as appropriate.
MTH 121 is a college-level general education elective. It serves as the mathematics requirement for most certificate and Associate of Applied Science 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.
<p>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. Students were provided with the same formulas and tables they had for the unit tests throughout the semester. They were also allowed to use a 3x5 index card of notes they created for each part of the exam. 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 a review assignment in MyMathLab two weeks prior to the final exam with similar questions. The review assignment counted as a test grade.</p> <p>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 (as were some of the unit tests during the semester).</p> <p>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.</p>

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 one of the four met the 75% correct criterion. The results show an improvement from the Spring 2015 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 2017 Number of students in assessment sample = 10 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 algebraic techniques to solve linear and quadratic	2.4. Evaluate $x^2 - 5x + 8$ for $x = 7$. 2.5. Solve the equation: $15(2x -$	65%	35%	No

<p>equations, graph linear equations, and solve application problems</p>	<p>$1) = 5(x + 2) + 2x.$</p> <p>2.6. Solve for y: $8x - 2y = 8.$</p> <p>2.7. Write an equation to represent the following statement. Then solve the equation. Fourteen less than three times a number is 22.</p> <p>2.8. Y is directly proportional to S and inversely proportional to V. Determine Y when $S = 2$, $V = 4$, and $k = 9$.</p> <p>2.9. Graph the equation $y = 5x - 5.$</p> <p>2.10. Solve the equation: $x^2 = 11x - 30.$</p> <p>6. Determine whether the variation between the indicated quantities is direct or inverse: The number of people in line at a bank and the amount of time required for the last person to reach the teller.</p> <p>7. Graph the solution set of the inequality, where x is a real number, on the number line: $-4 \leq x \leq 4.$</p>			
<p>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</p>	<p>1.1. Arrange the quantities in order from smallest to largest: 2.5 kL; 121,000 mL; 48.2 hL</p> <p>1.2. You bought a bottle of juice at the store. Choose the most reasonable measurement for its contents. a. 0.71 mL b. 0.71 L c. 0.71 kL</p> <p>1.3. A rectangular fish tank is 90 cm long, 30 cm wide, and 20 cm high. a) How many cubic centimeters of water will the tank hold? b) How many milliliters of water will the tank hold? c) How many liters of water will the</p>	<p>76%</p>	<p>24%</p>	<p>Yes</p>

	<p>tank hold?</p> <p>1.4. Change 30°C to degrees Fahrenheit. Round your answer to the nearest tenth if necessary.</p> <p>1.5. Convert 17 inches to centimeters. Round to the nearest hundredth if necessary.</p>			
<p>Outcome 3: Solve problems related to consumer math</p>	<p>1.15. Find the simple interest earned on \$1200 at a rate of $4\frac{1}{2}\%$ over 9 months.</p> <p>1.16. A loan is taken out on April 1 for \$3000 at a 4% interest rate. A partial payment of \$2000 is made on May 1. Determine the amount due on June 1, the maturity date. (Assume 360 days in a year.)</p> <p>1.17. Determine (a) the total amount accumulated and (b) the interest earned when \$6000 is invested for 5 years at 8% interest compounded daily (assume 360 days in a year). Round to the nearest cent if necessary.</p> <p>1.18. Landon is an auto mechanic who wishes to start his own business. He will need \$4800 to purchase tools and equipment. Landon decided to finance the purchase with a 60-month fixed installment loan with an APR of 6%. Determine the total finance charge.</p> <p>1.19. Jack wishes to purchase a used car that has a cash price of \$11,000. The installment terms include a down payment of \$4,000 and 36 monthly payments of \$223. What is the APR to the nearest half percent?</p> <p>1.20. On the July 7 billing date, Marvin had a balance due of \$126.74 on his credit card. The transactions during the following month were: July 16 Charge: office supplies \$65.79</p>	<p>58%</p>	<p>42%</p>	<p>No</p>

	<p>July 18 Charge: scarf \$10.29</p> <p>July 19 Payment \$150.00</p> <p>July 25 Charge: toy truck \$101.87</p> <p>The interest rate on the card is 1.25% per month. Using the previous balance method, find the new balance on August 7.</p> <p><i>For questions 21-22, the Fritzes are buying a house that sells for \$173,000. The bank is requiring a minimum down payment of 20%. To obtain a 40-year mortgage at 11.0% interest, they must pay 4 points at the time of closing.</i></p> <p>1.21. Determine the required down payment.</p> <p>1.22. Determine the amount paid for points.</p> <p><i>For questions 23-24, the Adeeva's gross monthly income is \$3800. They have 18 remaining payments of \$210 on a new car. They are applying for a 15-year, \$67,000 mortgage at 6.5%. The taxes and insurance on the house are \$260 per month. The bank will only approve a loan that has a total monthly mortgage payment of principal, interest, property taxes, and homeowners' insurance that is less than or equal to 28% of their adjusted monthly income.</i></p> <p>1.23. Determine 28% of the Adeeva's adjusted monthly income.</p> <p>1.24. Determine the Adeeva's total monthly mortgage payment, including principal, interest, taxes, and homeowner's insurance.</p> <p>1.25. Laura and Martin obtain a 20-year, \$190,000 conventional</p>			
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	<p>mortgage at 8.5% on a house selling for \$220,000. Their monthly mortgage payment, including principal and interest, is \$1649.20. Determine the total amount they will pay for their house.</p>													
<p>Outcome 4: Determine the probability of an event</p>	<p>2.11. Several friends chartered a boat for a day’s fishing. They caught a total of 65 fish. The table below provides information about the type and number of fish caught. Determine the empirical probability that the next fish caught is a grouper.</p> <table border="1" data-bbox="456 667 826 846"> <thead> <tr> <th>Fish</th> <th>Number caught</th> </tr> </thead> <tbody> <tr> <td>Grouper</td> <td>11</td> </tr> <tr> <td>Shark</td> <td>16</td> </tr> <tr> <td>Flounder</td> <td>6</td> </tr> <tr> <td>Kingfish</td> <td>32</td> </tr> </tbody> </table> <p>2.12. Each individual letter of the word FLORIDA is placed on a piece of paper, and all 7 pieces of paper are placed in a hat. If one letter is selected at random from the hat, find the probability that the letter “A” is selected.</p> <p>2.13. The results of a medical test show that of 32 people selected at random who were given the test, 22 tested negative and 10 tested positive. Determine the odds against a person selected at random from these 32 people testing negative on the test.</p> <p>2.14. A person randomly selects one of four envelopes. Each envelope contains a check that the person gets to keep. However, before the person can select an envelope, he or she must pay \$15 to play. Determine the person’s expectation if the checks in the envelopes are for \$0, \$3, \$8, and \$24.</p> <p>2.15. A box contains three cards. On one card there is a sun (S), on another card there is a question mark</p>	Fish	Number caught	Grouper	11	Shark	16	Flounder	6	Kingfish	32	<p>52%</p>	<p>48%</p>	<p>No</p>
Fish	Number caught													
Grouper	11													
Shark	16													
Flounder	6													
Kingfish	32													

	<p>(Q), and on the third card there is an apple (A). Two cards are to be selected at random <i>with</i> replacement.</p> <p>a) Determine the number of sample points in the sample space.</p> <p>b) Construct a tree diagram and list the sample space.</p> <p>c) Use the sample space to determine the probability that at most one card containing a question mark is selected.</p> <p>2.16. What is the probability of getting either a spade or a queen when drawing a single card from a deck of 52 cards?</p> <p>2.17. Consider a collection of envelopes consisting of 3 red envelopes, 2 blue envelopes, 1 green envelope, and 1 yellow envelope. If two envelopes are selected at random, <i>without</i> replacement, determine the probability that they are both red envelopes.</p>			
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* Please note if using a different minimum performance standard.

<p>Conclusions</p> <p>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”.</p>
<p>The results of this assessment show improvement from the Spring 2015 assessment. While only one of the four outcomes surpassed the 75% performance standard, two others saw an increase over the Spring 2015 performance. Possible reasons for this success and plans for continued improvement are discussed further below.</p>

<p>Previous Assessment Reports and Results</p> <p>Date of Previous Assessment: Spring 2015</p> <p>List of Outcomes Not Met: Apply algebraic techniques to solve linear and quadratic equations, graph linear equations, and solve application problems; perform conversions within the metric system and between the metric system and U.S. customary system and express quantities in appropriate metric units; solve problems related to consumer math; determine probability of an event</p> <p>Summary of Actions Taken to Address Unmet Learning Outcomes: Append additional pages if necessary. If appending, include notation in box to “See attached”.</p>

For the areas of concern, extra in-class examples, homework problems, and problems on the final exam review have been incorporated as discussed in the Spring 2015 assessment.

The test on consumer math has since been made a closed-note, closed-book test, and students have been provided with just the necessary formulas and tables. Initially, this did not seem to make a difference in performance, but classes over the past few semesters have done better.

A day has been allocated on the syllabus for review on the chapter for probability.

The final exam review has since been made a required assignment, counting as a test grade. The completion rate of the assignment has drastically improved following this implementation.

Continued monitoring of performance in MTH 121 based on prerequisite (see Attachment A) shows students who completed MTH 101 do better in MTH 121 than students who completed the comparable MTH 94 or MTH 95.

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

This was the one outcome that saw a *decrease* in performance (by 4%) from the last assessment. Solving a formula for a specified variable and solving a quadratic equation continue to be the two questions with the lowest number of correct responses. These topics will be addressed during final exam review in future classes.

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

This outcome has continued to show improvement and is now above the desired level of 76%. The extra examples and problems discussed in previous assessments will continue to be utilized.

Outcome 3: Solve problems related to consumer math

While this outcome still has significant room for improvement, the results have increased by 13% from the last assessment. As mentioned above, *not* giving this chapter test as open-book, open-note seems to have increased students' understanding and retention of this material, but it continues to be a challenging outcome. One possibility to consider is eliminating some of the unit-level objectives under this outcome to focus more time and energy on the remaining material.

Outcome 4: Determine the probability of an event

Like Outcome 3, this outcome is still well below the desired performance level but has improved significantly from the last assessment (52% versus 37%). Having a whole class period of review on this chapter has proven to be beneficial and will continue to be included on future course schedules. During this time, emphasis will be placed on finding odds and determining expectation, the two questions with the lowest number of correct responses.

As mentioned above, MTH 101 is proving to be a successful prerequisite to MTH 121 but will soon be replaced with a *co-requisite* supplement for students not meeting the placement criteria. Revisions to program requirements will also result in a return to the majority of students taking 121 versus 123 to fulfill their college-level math requirement. These factors could potentially have a significant impact on the results when the course is reassessed in Spring 2019.

**Assessment Committee Recommendation/Approval
(To be posted by Assessment Committee Chair)**

- Approved as presented
- Approved with recommendations for future reports (Explanation Required)
- Resubmission Required. Reason for Resubmission:

Date: 09-08-17

Attachment A: Analysis of MTH 121 Final Grades Based on Prerequisites (Spring 2015-Spring 2017)

	Final Grade in MTH 121					Total	Average
	A	B	C	D	F/UF		
Students who took and passed MTH 96, 97, 99, or 103	10	16	6	1	6	39	2.59
<i>Students who took and passed MTH 96</i>	1		2	1		4	2.25
<i>Students who took and passed MTH 97</i>	7	10	3		1	21	3.05
<i>Students who took and passed MTH 99</i>		1			2	3	1.00
<i>Students who took and passed MTH 103</i>	2	5	1		3	11	2.27
Students who took and passed MTH 94 or 95	3	6	8	2	6	25	1.92
<i>Students who took but did not pass MTH 96 or 97</i>		2	4	1	5	12	1.25
<i>Students who did not attempt MTH 96 or 97</i>	3	4	4	1	1	13	2.54
Students who took and passed MTH 101	1	6	6		2	15	2.27
Students who were not required to take any dev math courses	14	8	6		5	33	2.79
Students who did not meet prerequisites					1	1	0.00
	28	36	26	3	20	113	2.43
A = 4.0							
B = 3.0							
C = 2.0							
D = 1.0							
F/UF = 0.0							