General Education Assessment Results

Fall 2012

Description	Data Source(s)	Assessment Measure	Performance Criteria	Number of Students Assessed	% Exceeding Standard	% Meeting Standard	% Approaching Standard	% Not Meeting Standard	Proposed Action(s)
Mathematics									
Students will demonstrate the ability to estimate and check mathematical results for reasonableness	Exam 1, #18, Show calculation work. Use of graphing calculator is allowed. (8 pts) Simplify the inequality (4x-1)/3 >= x/5 - 1. Show calculation work. Use of graphing calculator is allowed (8pt)	8 pts = flawless execution (executed the algebraic work flawlessly and verified with the graphing calculator) 6 pts = one minor algebraic mistake (knew what the correct range of solution was but could not pinpoint it in their algebraic work due to small mistakes) 4 pts = multiple algebraic mistakes or a major conceptual mistake (made several mistakes in simplifying the fractions and combining like terms. The graphing calculator gave them a clear view of where the correct solution was, but they could not repair the algebraic mistakes to reconcile the difference) 0-2 pts = left it blank or showed incoherent calculation work (only gave answer from graphing calculator)	Exceeding = 8 pts Meeting = 6 pts Approaching = 4 pts failing to meet = 0-2 pts	16	42.9%	35.7%	14.3%	7.1%	Students expressed that simplifying the fractions (unifying the denominators) was the trickiest step. Students have effectively demonstrated their ability to check the solutions for reasonableness, but the lack of algebraic fineness makes some students unable to derive correct solution. Instructor will continue to supplement algebraic skill review throughout the course (distributing negative quantities or simplifying fractions)

Students will demonstrate the ability to employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems.	Exam #4 question logarithm question	grading scale 10 points per question	number wrong 0 = exceeds 1-3 = meets 4-6 = approaches >7 = fails to meet	38	32%	47%	13%	8%	
Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.	Exam 2 question Suppose you decide to go into an online business. You invest $2000 as your fixed cost in a venture that sells a new tool you saw at a trade show. Each tool sells (or retails) for $325. The tool costs you $275. a) Write a cost function C(x) for the product if x represents the number of tools purchased. (Assume linear function) b) Find the revenue function R(x) for each tool if each tool sells for $325. c) Give the profit function. d) How many tools must you sell to make a profit? (break even) e) What is the revenue from the sale of 80 tools? f) Graph the functions and show the appropriate domain and range.	Grading scale 10 points per question	Number wrong 0 = exceeds 1-3 = meets 4-6 = approaches >7 = fails	42	24%	48%	14%	14%	
Students will demonstrate the ability to estimate and check mathematical results for reasonableness	Exam #5 question In triangle ABC angle α= 350 , β=420 , a = 2.54. Find b, c, and angle lambda.	grading scale 10 points	number wrong 0 = exceeds 1-3 = meets 4-6 = approaches > 7 = fails	36	80%	8%	6%	6%	

Students will demonstrate the ability to recognize the limits of mathematical and statistical methods.	Three questions on test 1 on using the sample mean/median and sampling methods. See attached.	Number of questions correct.	Exceeding: 3/3 questions correct Meeting: 2/3 questions correct Approaching:1/3 questions correct Not meeting: 0/3 questions correct	194	68%	15%	14%	3%	83% of students met or exceeded standard which is satisfactory.
Students will demonstrate the ability to represent mathematical information symbolically, visually, numerically and verbally.	see attached	Students exceeding and meeting the standard selected choice E. Graph E was the only accepted correct answer on the exam.	exceeding/meeting = graph E approaching = graph G failing to meet = graphs F or H	16	87.5%	combined with exceeding	7.1%	7.1%	Most students grasp the concept; ideally all students should without the use of a graphing calculator. Instructor plans to stress how to detect the horizontal shift (x –H), and the characteristic of even-numbered exponent in a graph. This is an important skill students must have regardless the use of a graphing calculator.
Students will demonstrate the ability to recognize the limits of mathematical and statistical methods.	Exam 3, #49, multiple-choice, # 48 multiple-choice see attached	#49 Choice A was the only accepted answer on the exam #48 Choice D was the only accepted answer on the exam	#49 Exceeding/meeting = choice A Approaching/failing = choice B #48 Exceeding = choice D Meeting = choice A Approaching/failing = choice B or C	19	#49 84.2% Combined with meeting; #48 36.8%	#48 10.5%	#49 15.8% Combined with failing; #48 52.6% Combined with failing		#49: The function crosses the horizontal axis 5 times, indicating that there are 5 real roots + possible additional imaginary roots. Thus, it must be a 5th or higher degree function. There ought to be more #48: Some PreCalc students still have a hard time analyzing mathematical properties using abstract symbols. Using variable “n” to represent the exponent of a polynomial function makes it more difficult for students to visualize what the graph should look like. Concrete numbers like ax5 + bx4 + ... may be easier for the students. Instructor will spend consistent effort in class comparing concrete numbers with variables to help students transition into analytical abstract thinking.

Students will demonstrate the ability to represent mathematical information symbolically, visually, numerically and verbally.	Exam #3 question For the function defined by p(x) = 2x2 + 4x - 16 do the following: a) find the vertex analytically b) find the max or min analytically c) find the zeros using the quadratic equation analytically d) what is the domain and range of the function? f) what is the y intercept (analytically) g) ketch the graph below, label points a, b, c, f	grading scale 10 points	number wrong 0 = exceeds 1-3 = meets 4-6 = approaches >7 = fails	36	53%	25%	14%	8%	
Students will demonstrate the ability to represent mathematical information symbolically, visually, numerically and verbally.	Quiz on creating a histogram. See attached.	Rubric	Exceeding: all answers correct Meeting: data entry error, class width rounding error, counting error, other minor error Approaching: used # of classes or class limits instead of boundaries for graph, x & y axes switched, added class width across instead of down, other major conceptual errors Not meeting: no answers correct or no response	195	46%	17%	14%	24%	63% met or exceeded standard. Made changes to Statistics workbook to make the class width clearer.

Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.	Chapter 1 Linear Functions Worksheet You want to go into an online business that sells portable grills. You invest $2000 as the start-up cost. Each grill costs you $275 to import and you will sell it for retail price $325. a) Write a cost function C(x) for the product if x represents the number of grills imported at $275.00/piece (Assume a linear function) b) Find the revenue function R(x) if x represents the number of grills sold at the price $325.00/piece c) Write the profit function P(x) d) How many grills must you sell to break even? Show work. e) What is the revenue from the sale of 80 grills? Show work f) Graph C(x), R(x), and P(x) with the appropriate domain and range and units.	Parts (a) - (e) are 2 pts each and must be entirely correct to earn full credit. Part (f) is 4 pts. Grading is done on the 4-pt scale where 4 = exceeding and 1 = failing	4 = exceeding standards 3 = meeting standards 2 = approaching standards 1= not enough work shown (Failing to meet standard)	14	a)100% b)100% c)85.7% d)92.9 % e)28.6% f)28.6%	a)none b)none c)14.3% d)7.1% e)42.9% f)42.9%	a)none b)none c)none d)none e)28.6% f)28.6%	a)none b)none c)none d)none e)none f)none	Graphing techniques in part (f) have left a large margin for improvements. Only 4 students executed the graphing flawlessly. 6 out of the 14 students understood how to display the crucial information but used inappropriate ranges of values on the tickmarks. Another 4 students miscounted the spaces or tickmarks, resulting in incorrect intercepts and intersections. These are valuable insights so the instructor can see which concepts need more attention. Instructors will place more emphasis to address common mistakes: Incorrectly or having not labeled the x- or y- axis The x- or y- tickmarks are not scaled to show the "whole" picture of cost, revenue, and profit activities. Part (e) requires students to label a y value of 26,000. Some students used a narrower range of values, consequently missed out on 26,000. Not able to clearly display the correlation between part (c) and the intersection of Cost and Revenue.
Students will demonstrate the ability to employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems.	Test 3 confidence interval question. See attached.	rubric	Exceeding: completely correct Meeting: correct except for rounding error Approaching: wrong z or s, but correct formula Not Meeting: wrong formula or did not complete	177	36%	37%	13%	14%	73% of students met or exceeded the standard. Modified statistics workbook to stress difference between t and z intervals. Highlight rounding rules.

Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.	After drawing a stem and leaf plot, students are asked questions regarding the shape of the distribution and possible outliers. See attached.	Students are assessed based on a grading rubric developed and agreed upon by the faculty members teaching MATH 115 this semester.	Exceeding the standard - all answers are correct Meeting the standard - both answers are correct, but no explanation for ii Approaching the standard - 1 of 2 answers are correct Not meeting the standard - not answers are correct or no response	194	80%	3%	14%	3%	83% of students met or exceed the standard. Students understand the shape of the distribution from a stem and leaf plot. Possibly add questions reversing the thought process (ie, given the shape, describe a data set having that shape) or ask the same questions on different types of graphs (ie, histogram, box and whisker plot) and compare results.
Students will demonstrate the ability to recognize the limits of mathematical and statistical methods.	Exam #5 question An airplane with a speed of 220 knots is headed on a bearing of 135o (SE). A north (N)(wind direction is always "from". In this cased from the N to S) wind of 20 knots is blowing at 20 knots. Find the ground speed and actual bearing of the aircraft.	grading scale 10 points	number wrong 0 = exceeds 1-3 = meets 4-6 = approaches > 7 = fails to meet	39	26%	13%	18%	44%	
Students will demonstrate the ability to employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems.	Exam 5, #6, Show calculation work. Amy is about to start her cancer treatment. Her cancerous cell count is 6500 units right now. Her doctor is using the equation A=A0 e-kt with an 18% shrink rate to estimate the decay of her cancerous cell count. The doctor tells her that she can stop the treatment when the cell count is 80 units. If time is measured in weeks, how many weeks will it take for Amy's cell count to get down to 80? (8pt)	8 pts = conceptually and numerically correct, flawless execution 6 pts = one minor algebraic or rounding mistake 4 pts = multiple algebraic or rounding mistakes, or missing unit, or major conceptual mistake 2 pts = plugging numbers into wrong places, couldn't carry through the calculation, or showing scattered, incoherent calculation with incorrect result 0 pts = left it blank, didn't even try		16	35.7%	35.7%	28.6%	0%	Instructor will provide more growth/decay calculation problems so the students have experience with a wide range of word problems. Students needed to understand that this question represented an exponential decay. The rate of decay was governed by k = - 0.18, not +0.18. Graphically they could see the decay eventually flatted out. There has to be more practice on how to apply logarithms(quantifying the X axis)

Students will demonstrate the ability to estimate and check mathematical results for reasonableness	Question on Test 1: You calculate the z score for your friend's height and determine that z = 5.33. Is your result reasonable? Explain why or why not.	Rubric	Exceeding: Clear, correct explanation Meeting: Correct answer but explanation is not concise Approaching: Knows definition of z score but answers that z score is reasonable Failing to Meet: No answer or completely incorrect	194	47%	3%	13%	37%	Only 50% of students met or exceeded the standard. Need to stress not only the definition of z score, but also what it means. Include more problems addressing reasonableness of z score.
Science									
Students will demonstrate understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.				285	32%	35%	9%	23%	Recommend monitoring future student assessment in this outcome to determine if changes are warranted. It may be valuable if instructors emphasize Learning Outcome 1 with an extra assignment to reinforce understanding methods of observation.
Student will demonstrate application of scientific data, concepts, and models in one of the natural sciences.				285	54%	20%	13%	13%	None.
American History									
Students will demonstrate knowledge of a basic narrative of American history: political, economic, social and cultural, including knowledge of unity and diversity in American society.				85	14%	48%	25%	13%	

Student will demonstrate understanding of America's evolving relationship with the rest of the world.				57	14%	33%	33%	19%	
Students will demonstrate knowledge of common institutions in American society and how they have affected different groups.				85	14%	47%	26%	13%	
The Arts									
Students will demonstrate understanding of at least one principle form of artistic expression and the creative process inherent therein.				91	60%	27%	13%	0%	Grading matrices are being shared, discussed and developed to help students know what will be graded with each assignment. Different faculty teaching different sections of the same course have met to discuss requiring a similar list of materials and to make sure that course objectives were aligned.
Students will demonstrate knowledge of the distinctive features of culture(s) associated with the language they are studying.				31	49%	25%	10%	16%	Additional support will be given to students as to how effective comparisons between the two cultures are formulated and supported with facts to develop better compositions as well as participation
Foreign Language									
Students will demonstrate knowledge of the distinctive features of culture(s) associated with the language they are studying.				72	50%	19%	3%	0%	None.
Students will demonstrate basic proficiency in the understanding and use of a foreign language.				72	50%	33%	13%	4%	next semester I will provide an additional oral exam in the middle of the semester, so that students will have an opportunity to better-develop their oral abilities

Students will demonstrate basic proficiency in the understanding and use of a foreign language.				31	50%	25%	22%	3%	While the writing assignments showed positive development, more attention will be paid to increasing students' use of varied vocabulary and tenses other than the present tense.
Communication									
Student will evaluate an oral presentation according to established criteria.				52	42%	44%	8%	6%	Encourage faculty to be more critical and use the entire scoring rubric, as these results are higher than expected.
Student will locate, evaluate, and synthesize information from a variety of sources.				362	19%	41%	28%	12%	Develop a curriculum proposal recommending that, beginning in the fall 2013 semester, all General Studies A.A. and Liberal Arts A.A. (Humanities) students be required to take a second writing course upon completion of ENGL 100.
Student will develop proficiency in oral discourse.				53	31%	25%	44%	0%	Encourage faculty to use the entire rating rubric. These results are significantly higher than expected.
Student will understand and use basic research techniques to research a topic.				362	17%	33%	30%	20%	Develop a Vancko Hall page devoted to "best practices" in the teaching of composition at Delhi, with one section devoted entirely to teaching research and documentation, so that faculty can readily share successful teaching strategies.