Learning Outcomes Assessment Worksheet

Mathematics (2008-2009)

Lock Haven University of Pennsylvania

Program-Initiated Goal or Objective	Where, When, and How Monitored	Expectation for Satisfactory Performance	Observations of Student Performance	Results Analyzed When and by Whom	Outcome of Analysis	Dept. or Program Follow-up
*Process standard: Knowledge of reasoning and proof *Content standard: Algebra and number theory	Math 205 final examination Fall 2008	Identify required proof strategy as *reduction ad absurdum* or direct proof Item S08.1	Number of students who 27 exceeded 0 met 0 did not meet 0 exempted 27 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
Process standard: Knowledge of reasoning and proof	Math 205 final examination Fall 2008	Give correct direct proof of theorem Item S08.2	Number of students who 26 exceeded 0 met 1 did not meet 0 exempted 27 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
Process standard: Knowledge of reasoning and proof	Math 205 final examination Fall 2008	Give correct proof of theorem by *reduction ad absurdum* Item S08.3	Number of students who 21 exceeded 4 met 2 did not meet 0 exempted 27 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
Process standard: Knowledge of reasoning and proof	Math 205 final examination Fall 2008	Give correct direct proof of theorem Item S08.4	Number of students who 19 exceeded 4 met 4 did not meet 0 exempted 27 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
Process standard: Knowledge of reasoning and proof	Math 205 final examination Fall 2008	Give correct proof of theorem requiring "If and only if" with direct proof and contradiction combined Item S08.5	Number of students who 10 exceeded 6 met 11 did not meet 0 exempted 27 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009

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*Process standard: Knowledge of mathematical problem solving *Content standards: Algebra and number theory	Math 302 final examination Fall 2008	Solve linear Diophantine equation Item F08.6	Number of students who 10 exceeded 7 met 0 did not meet 0 exempted 17 TOTAL	Dept. meeting date: Other analysis (describe): Strayer, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Algebra and number theory	Math 302 final examination Fall 2008	Solve system of congruence equations Item F08.7	Number of students who 16 exceeded 1 met 0 did not meet 0 exempted 17 TOTAL	Dept. meeting date: Other analysis (describe): Strayer, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Geometry	Math 307 final examination Fall 2008	Perform correct compass and straight-edge construction Item F08.8	Number of students who 4 exceeded 7 met 2 did not meet 0 exempted 13 TOTAL	Dept. meeting date: Other analysis (describe): Strayer, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of reasoning and proof *Content standards: Geometry	Math 307 final examination Fall 2008	Prove correctly that a given compass and straight-edge construction is valid Item F08.9	Number of students who 4 exceeded 7 met 2 did not meet 0 exempted 13 TOTAL	Dept. meeting date: Other analysis (describe): Strayer, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Applied mathematics	Math 312 final examination Fall 2007	Demonstrate correct understanding of pdfs of absolutely continuous random variables Item F08.11	Number of students who 7 exceeded 4 met 5 did not meet 0 exempted 16 TOTAL	Dept. meeting date: Other analysis (describe): Mikula, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
*Process standard: Knowledge of mathematical problem solving *Content standards: Analysis	Math 312 final examination Fall 2007	Demonstrate understanding of marginal densities of AC random variables; demonstrate ability to perform integration from Calculus 1 and 2 Item F08.12	Number of students who 3 exceeded 5 met 8 did not meet 0 exempted 16 TOTAL	Dept. meeting date: Other analysis (describe): Mikula, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009

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*Process standard: Knowledge of mathematical problem solving *Content standards: Applied mathematics	Math 312 final examination Fall 2007	Demonstrate proper use and understanding of Law of Total Probability and Bayes' Theorem Item F08.14	Number of students who 15 exceeded 1 met 0 did not meet 0 exempted 16 TOTAL	Dept. meeting date: Other analysis (describe): Mikula, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Applied mathematics	Math 312 final examination Fall 2007	Demonstrate proper use and recognition of specific probability distributions Item F08.15	Number of students who 12 exceeded 2 met 2 did not meet 0 exempted 16 TOTAL	Dept. meeting date: Other analysis (describe): Mikula, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of reasoning and proof *Content standards: Geometry	Math 307 final examination Fall 2008	Provide correct proofs of concurrency theorems in Euclidean geometry	Number of students who 10 exceeded 3 met 0 did not meet 0 exempted 13 TOTAL	Dept. meeting date: Other analysis (describe): Strayer, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Applied mathematics	Math 312 final examination Fall 2008	Demonstrate understanding and correct use of particular probability distributions M312Fin.1	Number of students who 16 exceeded 1 met 1 did not meet 0 exempted 18 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of mathematical problem solving *Content standards: Analysis	Math 312 final examination Fall 2008	Demonstrate understanding of marginal densities of AC random variables; demonstrate ability to perform integration from Calculus 1 and 2 M312Fin.2	Number of students who 17 exceeded 0 met 1 did not meet 0 exempted 18 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)

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*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 312 final examination Fall 2008	Provide direct proof of results in probability theorem M312Fin.4	Number of students who 3 exceeded 5 met 10 did not meet 0 exempted 18 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 312 final examination Fall 2008	Provide direct proof of results in probability theorem M312Fin.5	Number of students who 5 exceeded 3 met 10 did not meet 0 exempted 18 TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 401 final examination Fall 2007	Provide proof of limit at infinity of rational expression M401F07.7	Number of students who 8 exceeded 8 met 4 did not meet 0 exempted 20 TOTAL	Dept. meeting date: Other analysis (describe): D. Burkett, using Dept approved guidelines	Objective: [X] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[X] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 401 final examination Fall 2007	Provide proof that sequence is Cauchy M401F07.9	Number of students who 8 exceeded 7 met 5 did not meet 0 exempted 20 TOTAL	Dept. meeting date: Other analysis (describe): D. Burkett, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 401 final examination Fall 2007	Provide proof of convergence of product of convergent sequences M401F07.11	Number of students who 6 exceeded 5 met 8 did not meet 1 exempted 20 TOTAL	Dept. meeting date: Other analysis (describe): D. Burkett, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009

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*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 401 final examination Fall 2007	Provide proof by contradiction of uniqueness of supremum of set M401F07.14	Number of students who 5 exceeded 7 met 7 did not meet 1 exempted 20 TOTAL	Dept. meeting date: Other analysis (describe): D. Burkett, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
*Process standard: Knowledge of reasoning and proof *Content standards: Analysis	Math 401 final examination Fall 2007	Provide proof of convergence of product of convergent sequences M401F07.5	Number of students who 5 exceeded 9 met 5 did not meet 1 exempted 20 TOTAL	Dept. meeting date: Other analysis (describe): D. Burkett, using Dept approved guidelines	Objective: [ ] Wholly satisfied [X] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [X] Reexamine by . . . Aug 2009
			Number of students who ___ exceeded ___ met ___ did not meet ___ exempted TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
			Number of students who ___ exceeded ___ met ___ did not meet ___ exempted TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)
			Number of students who ___ exceeded ___ met ___ did not meet ___ exempted TOTAL	Dept. meeting date: Other analysis (describe): Morgan, using Dept approved guidelines	Objective: [ ] Wholly satisfied [ ] Partially satisfied [ ] Not satisfied	[ ] None required [ ] Complete by . . . [ ] Reexamine by . . . (date)

Other observations? Unexpected findings? Overall what changes/improvements are planned as a result of the assessments shown in the table?