Northern New Mexico College
Core Competencies Report

Date Submitted: September 28, 2010

Attachments (check all that apply):

	Area I Communications	*Contact person*	Dr. Mellis Schmidt
XX	Area II Math-Algebra	*Contact person*	Dr. David Torres
XX	Area II Math-Calculus I	*Contact person*	Dr. David Torres
	Area II Math-Other Math	*Contact person*	Dr. David Torres
XX	Area III Laboratory Science	*Contact person*	Dr. Ajit Hira
	Area IV Social & Behavioral Science	*Contact person*	Dr. Mellis Schmidt
	Area V Humanities & Fine Arts	*Contact person*	Ms. Donna Winchell

This report fulfills reporting requirements for the New Mexico Higher Education Department.

Attested

Dr. Anthony Sena
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Comments

In this report, we describe Common Core assessment and program improvement activities that we initiated in 2009-2010 in Area II and Area III Common Core courses.

In Fall, 2007, our Student Learning Achievement Committee developed a **five-year data reporting sequence** and **annual improvement cycle** for the assessment of Common Core courses. The five-year reporting sequence was as follows:

- Area I Communications in AY08.
- Area II Mathematics in AY09.
- Area III Lab Sciences in AY10.
- Area IV Social and Behavioral Sciences in AY11, and
- Area V Humanities and Fine Arts in AY12.

Our annual improvement cycle for each area of the Common Core has included the following:

- Align competencies and measures in a faculty workshop in summer.
- Teach, assess, and gather data in fall and spring.
- Input findings and analysis in our assessment management system in spring and summer.
- Develop program improvements (and formalize curriculum changes prior to the development of the College Catalog) in late spring, summer, and the year following.

The Area II and Area III data that we present here followed the four steps of the annual improvement cycle.

At present, we are improving all of our academic assessment processes, including those for Northern's Common Core. **We expect to report on all five areas of the Common Core in Fall 2011.**

| Core Competencies Assessment 2009-2010: Area II Courses | | | |
Northern New Mexico College		Mathematics – Algebra Competencies	
1. Students will graph functions.	**Course** MATH 150/1113 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 150-101** 53% students met competency **MATH 150-102** 53% students met competency **MATH 150-103** 67% students met competency	Departmental faculty designed the following improvements based on the analysis of all MATH departmental data, including those for College Algebra. **Use 70% for our goal of having all students pass the final exam.** As far as core competencies in College Algebra, improvements still need to be made in the student knowledge of graphing, using function notation, and solving equations. The scores in all three classrooms were above 50%. However we would like 70% of the students to be proficient in these areas. **Use math center for math projects for MATH 150.** The department has not been successful in implementing projects into courses. However, the math department in collaboration with the Student Success Center has a new math center which will be ideal to use for a classroom. Possible projects could be performed in-class in MATH 150. For example, sequences of complex numbers can be studied and used to create fractals. **Use online resources.** Cengage, which is a publisher of many of our math texts, has extensive online resources which can be used by our math instructors to improve the tutoring support and grading infrastructure in courses. A few instructors, Dr. Claudia Aprea, Ray Romero, Jose Antonio Lopez and Dr. Ajit Hira expressed an interest in testing out these online resources in Fall 2010. Some, depending on their experiences, may decide to use
2. Students will solve various kinds of equations.	**Course** MATH 150/1113 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 150-101** 53% students met competency **MATH 150-102** 53% students met competency **MATH 150-103** 64% students met competency	
3. Students will demonstrate the use of function notation and perform operations on functions.	**Course** MATH 150/1113 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 150-101** 65% students met competency **MATH 150-102** 60% students met competency **MATH 150-103** 67% students met competency	
4. Students will model and solve real world problems.	**Course** MATH 150/1113. **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 150-103** 83% students met competency	

			these resources in their courses in Spring 2011. A training session was scheduled for August 24th.
			Improve student learning data gathering process. Improve student learning data gathering process so as to involve all full- and part-time instructors who teach Area III courses. The improved process will be in place for gathering student learning data within the last two weeks of Fall 2010 semester.

Core Competencies Assessment 2009-2010: Area II Courses			
Northern New Mexico College		Mathematics – Calculus I Competencies	
State Compe-tencies	**Assessment Procedures**	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will demonstrate understanding of theoretical underpinnings of the calculus.	**Course** MATH 162/1624 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 162-101** 74% of the students met "fundamental theorem of calculus" competency	Departmental faculty designed the following improvements based on the analysis of all MATH departmental data, including those for Calculus I. **Use 70% for our goal of having all students pass the final exam.** In regards to core competencies in Calculus I, students performed well (above 70%) in all areas: finding tangent lines, computing difference quotients, understanding the Fundamental Theorem of Calculus, using Riemann sums and differentiation techniques, finding points of discontinuity, using trigonometric functions, finding extreme points and values, constructing graphs with the first and second derivatives and using differentials. **Use online resources.** Cengage, which is a publisher of many of our math texts, has extensive online resources which can be used by our math instructors to improve the tutoring support and grading infrastructure in courses. A few instructors, Dr. Claudia Aprea, Ray Romero, Jose Antonio Lopez and Dr. Ajit Hira expressed an interest in testing out these online resources in Fall 2010. Some, depending on their experiences, may decide to use these resources in their courses in Spring 2011. A training session was scheduled for August 24th. **Improve student learning data gathering process.** Improve student learning data gathering process so as to involve all full- and part-time instructors who teach Area III courses. The improved
2. Students will use concepts of function, limit, continuity, de-rivative, and integral.	**Course** MATH 162/1624 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 162-101** The percentages of students meeting the following competencies are outlined below: - Understanding limit: 77% - Understanding tangent line: 75% - Understanding difference quotient: 75% - Using differentiation techniques: 77% - Using points of discontinuity: 75% - Using trigonometric functions: 75% - Understanding differentials: 70% Average: 74.9%	
3. Students will apply methods of calculus to optimization, graphing, and approximation.	**Course** MATH 162/1624 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 162-101** 77% of the students met this competency	
4. Students will apply differen-tial and integral calculus to problems in ge-ometry, physics, and other fields.	**Course** MATH 162/1624 **Instrument** Departmentally standardized final exams.	**Spring 2010** **MATH 162-101** The percentages of students meeting the following competencies are outlined below: - Using Riemann sums: 74% - Using extreme values: 77% Average: 75.5%	

			process will be in place for gathering student learning data within the last two weeks of Fall 2010 semester.

	Core Competencies Assessment 2009-2010: Area III Courses		
	Northern New Mexico College	**Laboratory Science Competencies**	
State Competencies	**Assessment Procedures**	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Describe the process of scientific inquiry.	**Courses** BIOL 110/L/1114 CHEM 110/L/1114 PHYS 110/L/1114 **Instrument** Tests on familiarity with the scientific method.	**Fall 2009** **ASTR 110** # students=23; # met target=19 Test: A's=7, B's=12, C's=4, D's=0 Average=3.13 **CHEM 121** # students=16; # met target=10 Test: A's=7, B's=3, C's=4, D's=2 Average=2.94 **PHYS 121** # students=17; # met target=12 Test grades: A's=4, B's=8, C's=4, D's=1 Average=2.88 **Spring 2010** **CHEM 122** # students=8; # met target=7 Test: A's=4, B's=3, C's=0, D's=1 Average=3.25 **PHYS 121** # students=13; # met target=10 Test: A's=4, B's=6, C's=3, D's=0 Average=3.08 **PHYS 122** # students=16; # met target=12 Test: A's=4, B's=8, C's=4, D's=0 Average=3.00	Departmental faculty designed the following improvements for Area III courses based on the analysis of all of the departmental data: **Develop curriculum map for Area III courses, outcomes, and measures**. The map will spell out the relationship of each outcome and measure to all courses, including ASTR 110/L, BIOL 110/L, CHEM 110/L, ES 112/L, GEOL 101/L, GEOL 102/L, and PHYS 110/L. Measures will be revised so as to align better with elements of the map. **Encourage students' own self study.** Identify resources, strategies, assessments, and incentives that will support students' own self-study and development in Area III courses. Include information in all Area III course syllabi starting in Spring 2011. **Explore possibilities for a Science Center.** Establish a working group of faculty who teach Area III courses. The group will explore possibilities for establishing a Science Center, along the lines of the college's Writing and Math Centers, where students could receive tutoring and small group assistance.

| 2. Solve problems scientifically. | **Courses**
BIOL 110/L (BIOL 1114),
CHEM 110/L (CHEM 1114)
PHYS 110/l (PHYS 1114)
Instrument
Rubric (see attached instrument). | **Fall 2009**
ASTR 110
students=23; # met target=9
Scores: commendable=4, good=5, satisfactory=7, NI=7
Average=2.26
CHEM 121
students=16; # met target=14
Scores: commendable=8, good=6, satisfactory=2, NI=0
Average=3.38
PHYS 121
students=17; # met target=9
Scores: commendable=3, good=6, satisfactory=5, NI=3
Average=2.53

Spring 2010
ASTR 110
students=27; # met target=13
Scores: commendable=6, good=7, satisfactory=9, NI=5
Average=2.52
CHEM 122
students=8; # met target=7
Scores: commendable=7, good=0, satisfactory=0, NI=1. Average=3.63
PHYS 121.
students=13; # met target=8
Scores: commendable=3, good=5, satisfactory=4, NI=1
Average=2.77
PHYS 122.
students=16; # met target=1
Scores: commendable=5, good=6, satisfactory=4, NI=1
Average=2.94 | **Improve student learning data gathering process.** Improve student learning data gathering process so as to involve all full- and part-time instructors who teach Area III courses. The improved process will be in place for gathering student learning data within the last two weeks of Fall 2010 semester. |

3. Communicate scientific information.	**Courses** BIOL 110/L (BIOL 1114), CHEM 110/L (CHEM 1114) PHYS 110/l (PHYS 1114) **Instrument** Rubric (see attached instrument).	**Fall 2009** **ASTR 110** # students=23; # met target=16 Scores: commendable=7, good=9, satisfactory=5, NI=2 Average=2.91 **CHEM 121** # students=16; # met target=12 Scores: commendable=6, good=6, satisfactory=2, NI=2 Average=3.00. **CHEM 122** # students=8; # met target=4. Scores: commendable=2, good=2, satisfactory=1, NI=3 Average=2.38 **PHYS 121** # students=17; # met target=10 Scores: commendable=4, good=6, satisfactory=4, NI=3 Average=3.18 **Spring 2010** **ASTR 110** # students=27; # met target=18 Scores: commendable=8, good=10, satisfactory=6, NI=3 Average=2.85 **PHYS 121** # students=13; # met target=8 Scores: commendable=4, good=4, satisfactory=4, NI=1 Average=2.85 **PHYS 122** # students=16; # met target=13 Scores: commendable=6, good=7, satisfactory=3, NI=0 Average=3.19	

4. Apply quantitative analysis to scientific problems.	**Courses** BIOL 110/L (BIOL 1114), CHEM 110/L (CHEM 1114) PHYS 110/l (PHYS 1114) **Instrument** Rubric (see attached instrument).	The rubric instrument used was not in alignment with this competency. Data were not available.	
5. Apply scientific thinking to real world problems.	**Courses** BIOL 110/L (BIOL 1114), CHEM 110/L (CHEM 1114) PHYS 110/l (PHYS 1114) **Instrument** Rubric (see attached instrument).	The rubric instrument used was not in alignment with this competency. Data were not available.	

Student _____   Date _____

PROJECT RUBRIC				
	(4) Commendable	(3) Good	(2) Satisfactory	(1) Needs improvement	Subtotal & comments
Apply the scientific method	Demonstrates thorough mastery of scientific method; includes problem, hypothesis, plan, procedures, results, and significance; problem is presented and solved with accuracy.	Demonstrates adequate mastery of the scientific method; includes most but not all aspects; problem is presented and solved with overall accuracy but also with one or two minor errors.	Demonstrates satisfactory mastery of the scientific method; includes some but not all aspects; problem is presented and solved but with one or two distracting errors.	Demonstrates little understanding of the scientific method; steps are illogical or missing all together.	
Communicate results	Develops solution and generalizes it to other circumstances; makes other students understand through oral presentation with good eye contact and body language; addresses questions; written report represents original work, includes logical arguments, and has page numbers, sections, and is free of grammatical errors.	Presents solution only to the specific problem; oral presentation is conducted with adequate eye contact and body language; written report represents original work but has minor mistakes and/or grammatical errors.	Presents solution to the specific problem; oral presentation is conducting with average eye contact and body language; written report represents original work but has distracting/major mistakes and/or grammatical errors.	Fails to present a solution; peers do not understand; eye contact and/or body language in the oral presentation are poor; written report has illogical elements or ones missing altogether, and/or has many grammatical errors.	
Demonstrate curiosity	Consults the professor and peers readily; asks questions.	Consults the professor and peers occasionally; asks questions.	Consults the professor or peers, and asks questions, but infrequently.	Demonstrates lack of interest in the material.	
Demonstrate persistence	Demonstrates unflagging enthusiasm and persistence.	Doesn't give up in the face of obstacles; does not change the assigned problem.	Doesn't give up in the face of obstacles.	Gives up in the face of minimal obstacles.	
Overall comments				