University of New Mexico – Los Alamos
Core Competencies Report

Date Submitted October 30, 2009
Attachments (please check all that apply):

X	Area I Communications	*Contact Person*	*Mickey Marsee*
X	Area II Math—Algebra	*Contact Person*	*Kay Willerton*
X	Area II Math—Calculus	*Contact Person*	*Kay Willerton*
X	Area II Math—Other Math	*Contact Person*	*Kay Willerton*
X	Area III Laboratory Science	*Contact Person*	*Oksana Gerlits*
X	Area IV Social/Behavioral Sciences	*Contact Person*	*Carol Furchner/Cindy Rooney*
X	Area V Humanities/Fine Arts	*Contact Person*	*Patrick Harris*

This report fulfills reporting requirements for the New Mexico Higher Education Dept.
Attested:

Kate Massengale — *Chief Academic Officer Signature*

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AREA 1 - Communications Competencies

ENGL 101 – ENGL 1113
ENGL 102 – ENGL 1114
CJ 130 – COMM 1113

Report Template
Assessment Tool/Rubric

Please note: all syllabi for all courses are at the end of this report.

Core Competencies Assessment 2008-2009: Area I Courses—Communication Competencies

University of New Mexico- Los Alamos ENGL 101/ ENGL 1113

State Competencies (Learning Outcomes Being Measured)	Assessment Procedures ENGL 101/ENGL 1113 Final Essay Exam assessed by panel --Rubric attached	Assessment Results Assessed Fall 2008 (all percentages are rounded)	How Results Will Be Used To Make Improvements
1. Students will analyze and evaluate oral and written communication in terms of situation, audience, purpose, aesthetics, and diverse points of view. Students should: Understand, appreciate, and critically evaluate a variety of written and spoken messages in order to make informed decisions.	• Skill A1 Logical Order (Rhetorical Framework) • Skill B1 Support Ideas (Answers Question)	***Skill A1*** Mastered 29% Acquired 50% Practicing 21% Skill not present 0% ***Skill B1*** Mastered 18% Acquired 57% Practicing 25% Skill not present 0% We not only hit our goal of 75% this year, but we surpassed it in Skill A1. We will continue our practices and monitor our progress.	Last year's results of this assessment led us to do some initial teacher training on rhetorical context. This year's combined Mastered/Acquired increased so we will continue to train new instructors on rhetorical context.
2. Students will express a primary purpose in a compelling statement and order supporting points logically and convincingly. Students should: Organize their thinking to express their viewpoints clearly, concisely, and effectively.	• Skill A1 Logical Order (Rhetorical Framework • Skill A2 Logical Order (Within Paragraph)	***Skill A1*** Mastered 29% Acquired 50% Practicing 21% Skill not present 0% ***Skill A2*** Mastered 21% Acquired 54% Practicing 25% Skill not present 0%	Overall indicated students (79%) understood use of rhetorical patterns. Will continue to work on ordering within paragraphs in classroom exercises.
3. Students will use effective rhetorical strategies to persuade, inform, and engage. Students should: Select and use the best means to deliver a particular message to a particular audience. Rhetorical strategies include but are not limited to modes (such as narration, description, and persuasion), genres (essays,	• Skill B2 Support Ideas (Uses specific examples)	***Skill B2*** Mastered 25% Acquired 64% Practicing 14% Skill not present 0%	Results (89%) indicate that we will continue exercises on practicing indentifying and incorporating examples and support.

web pages, reports, proposals), media and technology (PowerPointTM, electronic writing), and graphics (charts, diagrams, formats).			
4. Students will employ writing and/or speaking processes such as planning, collaborating, organizing, composing, revising, and editing to create presentations using correct diction, syntax, grammar, and mechanics. Students should: Use standard processes for generating documents or oral presentations independently and in groups.	• Skill C Sentence Clarity	***Skill C*** Mastered 25% Acquired 39% Practicing 36% Skill not present 11%	Results (64%) indicated that some additional work needed to be done on sentence clarity. We will work on mechanic skills more in class with workshops and exercises.
5. Students will integrate research correctly and ethically from credible sources to support the primary purpose of a communication. Students should: Gather legitimate information to support ideas without plagiarizing, misinforming or distorting.	• Skill B2 Answers Question (Uses specific examples)	***Skill B2*** Mastered 25% Acquired 64% Practicing 14% Skill not present 0%	Results (89%) indicate that we will continue exercises on practicing indentifying and incorporating examples and support.
6. Students will engage in reasoned civic discourse while recognizing the distinctions among opinions, facts, and inferences. Students should: Negotiate civilly with others to accomplish goals and to function as responsible citizens. End -- Area I	Not assessed at this time		Will discuss need for assessment.

Area I Assessment completed by

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September 18, 2009
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English 101 Final Exam Assessment Form Definitions

Skill	Skill area	Mastered Skill	Acquired Skill	Practicing Skill	Skill not present
A. Logical Order	1. Uses appropriate rhetorical framework for context	Uses pattern the question asks for effectively with identifiable thesis	Mostly uses the pattern	Attempts to use the pattern but fails at some point; thesis partly frames paper	Does not follow pattern asked for; thesis is absent or unidentifiable
	2. Within paragraphs and among paragraphs	Consistently Uses old/new contract pattern and transitions consistently; varies transitional techniques	Mostly uses old/new contract pattern and appropriate transitions choices	Occasionally uses old/new context, has a few transitional elements, may not choose appropriate transitional words	Does not use old/new context, uses no or few transitions
B. Supports Ideas	1. Answers question	Well developed response; thesis is creative/ interpretive or analytical; offers analysis- offers complexity	Basic response; thesis responds to topic; clear connections between text and writer's conclusions	Responds to some of question; thesis mechanical; attempts connections between text and writer's conclusions	Does not address topic; few connections between question, text, and writer's conclusions
	2. Uses specific, concrete examples	Chooses points and particulars from materials and connects them to own observations	Uses points and some particulars, a few missing connections between materials and observations	Relies on generalities, specifics may not match connections; summary with some analysis but no synthesis	Relies on generalities, does not connect materials
C. Sentence Clarity	1. Clear sentence meaning	Varied, forceful, and contains no structural errors; usage promoting style	Varied, less than 3 structural errors with complementary usage	Mostly correct, with no more than 5 structural errors; choppiness, murky wording, wordiness	More than 5 structural errors or unclear passages, colloquial wording

Core Competencies Assessment 2008-2009: Area I Courses—Communication Competencies
ENGL 102/ ENGL 1114
University of New Mexico-Los Alamos

State Competencies **(Learning Outcomes Being Measured)**	**Assessment Procedures** **ENGL 102/ENGL 1114 Final Essay Exam assessed by panel -- Rubric attached**	**Assessment Results** **Assessed Spring 2009** **(all percentages are rounded)**	**How Results Will Be Used To Make Improvements**
1. Students will analyze and evaluate oral and written communication in terms of situation, audience, purpose, aesthetics, and diverse points of view. Students should: Understand, appreciate, and critically evaluate a variety of written and spoken messages in order to make informed decisions.	Skill A: Logical Area	***Skill A*** Mastered 53% Acquired 38% Practicing 8% Skill not present 0% *The exams were panel evaluated by the English instructors. We exceeded our expectations of 75% mastered/acquired .*	We felt the assessment rubric was successful and informative and decided to continue to use it. We also feel this success is the result of new Engl 101 curriculum combined with our Engl 102.
2. Students will express a primary purpose in a compelling statement and order supporting points logically and convincingly. Students should: Organize their thinking to express their viewpoints clearly, concisely, and effectively.	Skill A: Logical Area	***Skill A*** Mastered 53% Acquired 38% Practicing 8% Skill not present 0% *We were shy of our 75% goal of students Acquiring the skill or better.*	These results showing a 91% success rate indicate that we will continue to use our current curriculum for organization in essay writing.
3. Students will use effective rhetorical strategies to persuade, inform, and engage. Students should: Select and use the best means to deliver a particular message to a particular audience. Rhetorical strategies include but are not limited to modes (such as narration, description, and persuasion), genres (essays, web pages, reports, proposals), media and technology (PowerPointTM, electronic writing), and graphics (charts, diagrams, formats).	Skill A: Logical Area	***Skill A*** Mastered 53% Acquired 38% Practicing 8% Skill not present 0% *We were shy of our 75% goal of students Acquiring the skill or better.*	Results indicate that we will continue exercises on practicing rhetorical framework.
4. Students will employ writing and/or	Skill C: Sentence Clarity	***Skill B2***	Results (85%) indicated that

speaking processes such as planning, collaborating, organizing, composing, revising, and editing to create presentations using correct diction, syntax, grammar, and mechanics. Students should: Use standard processes for generating documents or oral presentations independently and in groups.		Mastered 32% Acquired 53% Practicing 14% Skill not present 3%	current curriculum is successfully addressing sentence clarity learning.
5. Students will integrate research correctly and ethically from credible sources to support the primary purpose of a communication. Students should: Gather legitimate information to support ideas without plagiarizing, misinforming or distorting.	Skill B: Supports Ideas	***Skill B2*** Mastered 45% Acquired 38% Practicing 14% Skill not present 3%	Results (83%) indicate that we will continue exercises on practicing indentifying and incorporating examples and support.
6. Students will engage in reasoned civic discourse while recognizing the distinctions among opinions, facts, and inferences. Students should: Negotiate civilly with others to accomplish goals and to function as responsible citizens. End -- Area I	Not assessed at this time		Will discuss need for assessment.

Area I Assessment completed by
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English 102 Final Essay Exam Assessment Form

Please clearly mark in the middle of the box. **Choose only ONE box** and **do not skip** any boxes.

Skill	Skill Area	Mastered Skill	Acquired Skill	Practicing Skill	Skill not present
A. Logical Area	**Uses appropriate rhetorical framework for context**				
B. Supports Ideas	**Integrates textual references**				
C. Sentence Clarity	**Sentence meaning clear**				

Holistic Evaluation Pass

Low Pass

Fail

Graded by

English 102 Final Essay Exam Assessment Definitions

Skill	Skill Area	Mastered Skill	Acquired Skill	Practicing Skill	Skill not present
A. Logical Area	Uses appropriate rhetorical framework for context	Thesis/essay framework states and develops argument and analysis of question	Thesis/Essay framework develops argument/analysis with some irregularities	Thesis/Essay Framework summaries paper with little argument/analysis developed	Absent thesis/essay framework or summary only with no argument/analysis
B. Supports Ideas	Integrates textual references	Integrates textual references to support analysis/argument and draws conclusions	Integrates textual references but may misses supporting some analysis, arguments or conclusions	Minimal, overused or unsupported textual references	No textual references
C. Sentence Clarity	Sentence meaning clear	Varied, forceful, and contains no structural errors; usage promoting style	Varied, less than 2 structural errors with complementary usage	Mostly correct, with no more than 5 structural errors; choppiness, murky wording, wordiness	More than 5 structural errors or unclear passages, colloquial wording

Core Competencies Assessment 2008-2009: Area I Courses—Communication Competencies
CJ 130/ COMM 1113
University of New Mexico- Los Alamos

State Competencies **(Learning Outcomes Being Measured)**	**Assessment Procedures** **CJ 130/ COMM 1113 Rubric for Final presentation (attached)**	**Assessment Results** **Will be assessed Spring 2009**	**How Results Will Be Used To Make Improvements**
1. Students will analyze and evaluate oral and written communication in terms of situation, audience, purpose, aesthetics, and diverse points of view. Students should: Understand, appreciate, and critically evaluate a variety of written and spoken messages in order to make informed decisions.	Not assessed at this time.		We will discuss need for assessment.
2. Students will express a primary purpose in a compelling statement and order supporting points logically and convincingly. Students should: Organize their thinking to express their viewpoints clearly, concisely, and effectively.	Skill A: Organization		Results of Spring 2009 assessment will be discussed at teacher orientation meeting at the beginning of Fall 2010 semester. We will discuss implications of results and needs for improvements at that time.
3. Students will use effective rhetorical strategies to persuade, inform, and engage. Students should: Select and use the best means to deliver a particular message to a particular audience. Rhetorical strategies include but are not limited to modes (such as narration, description, and persuasion), genres (essays, web pages, reports, proposals), media and technology (PowerPointTM, electronic writing), and graphics (charts, diagrams, formats).	Skill B: Audience Adaptation Skill D: Delivery		Results of Spring 2009 assessment will be discussed at teacher orientation meeting at the beginning of Fall 2010 semester. We will discuss implications of results and needs for improvements at that time.
4. Students will employ writing and/or speaking processes such as planning, collaborating, organizing, composing, revising, and editing to create presentations using correct diction, syntax, grammar, and mechanics. Students should: Use standard processes for generating documents or oral presentations independently and in groups.	Skill C: Language Use Skill D: Delivery		Results of Spring 2009 assessment will be discussed at teacher orientation meeting at the beginning of Fall 2010 semester. We will discuss implications of results and needs for improvements at that time.
5. Students will integrate research correctly and ethically from credible sources to support the primary purpose of a communication. Students should: Gather legitimate information to support ideas without plagiarizing,	Not Assessed at this time.		We will discuss the need for assessment.

misinforming or distorting.			
6. Students will engage in reasoned civic discourse while recognizing the distinctions among opinions, facts, and inferences. Students should: Negotiate civilly with others to accomplish goals and to function as responsible citizens. End -- Area I	Not assessed at this time		Will discuss need to assess.

Area I Assessment completed by

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C&J 130: Public Speaking **Semester:**
Assessment Rubric—Final Presentation **Assessed by:**

Skill	No Mastery	Partial Mastery	Mastery
1. Organization			
2. Topic Knowledge			
3. Audience Adaptation			
4. Language Use (Verbal Effectiveness)			
5. Delivery (Nonverbal Effectiveness)			

C&J 130: Public Speaking
Final Presentation Assessment Rubric

Skill	No Mastery	Partial Mastery	Mastery
A. Organization	Ideas may not be focused or developed; main purpose is unclear. Introduction is undeveloped. Main points are difficult to identify. Transitions may be needed. There is no conclusion or may not be clear the presentation has concluded. Conclusion does not tie back to the introduction. Audience cannot understand presentation because there is no sequence of information.	Main idea is evident, but the organizational structure many need to be strengthened; ideas may not clearly developed or always flow smoothly and the purpose is not clearly stated. The introduction may not be well developed. Main points are not clear. Transitions may be awkward. Supporting material may lack in development. The conclusion may need additional development. Audience has difficulty understanding the presentation because the sequence of information is unclear.	Ideas are clearly organized, developed, and supported to achieve a purpose; the purpose is clear. The introduction gets the attention of the audience and clearly states the specific purpose of the speech. Main points are clear and organized effectively. The conclusion is satisfying and relates back to introduction. (If the purpose of the presentation is to persuade, there is a clear action step identified and an overt call to action.)
B Audience Adaptation	The presenter is not able to keep the audience engaged. The verbal or nonverbal feedback from the audience may suggest a lack of interest or confusion. Topic selection does not relate to audience needs and interests.	The presenter is able to keep the audience engaged most of the time. When feedback indicates a need for idea clarification, the speaker makes an attempt to clarify or restate ideas. Generally, the speaker demonstrates audience awareness through nonverbal and verbal behaviors. Topic selection and examples are somewhat appropriate for the audience, occasion, or setting. Some effort to make the material relevant to audience needs and interests.	The presenter is able to effectively keep the audience engaged. Material is modified or clarified as needed given audience verbal and nonverbal feedback. Nonverbal behaviors are used to keep the audience engaged. Delivery style is modified as needed. Topic selection and examples are interesting and relevant for the audience and occasion.
C.. Language Use (Verbal Effectiveness)	Language choices may be limited, peppered with slang or jargon, too complex, or too dull. Language is questionable or inappropriate for a particular audience, occasion, or setting. Some biased or unclear language may be used.	Language used is mostly respectful or inoffensive. Language is appropriate, but word choices are not particularly vivid or precise.	Language is familiar to the audience, appropriate for the setting, and free of bias; the presenter may "code-switch" (use a different language form) when appropriate. Language choices are vivid and precise.
D. Delivery (Nonverbal Effectiveness)	The delivery detracts from the message; eye contact may be very limited; the presenter may tend to look at the floor, mumble, speak inaudibly, fidget, or read most of the speech; gestures and movements may be jerky or excessive. The	The delivery generally seems effective – however, effective use of volume, eye contact, vocal control, etc. may not be consistent; some hesitancy may be observed. Vocal tone, facial expressions, clothing and other nonverbal expressions do not detract	The delivery is extemporaneous -- natural, confident, and enhances the message – posture, eye contact, smooth gestures, facial expressions, volume, pace, etc. indicate confidence, a commitment to the

	delivery may appear inconsistent with the message. Nonfluencies ("ums") are used excessively. Articulation and pronunciation tend to be sloppy. Poise of composure is lost during any distractions. Audience members have difficulty hearing the presentation.	significantly from the message. The delivery style, tone of voice, and clothing choices do not seem out-of-place or disrespectful to the audience or occasion. Some use of nonfluencies are observed. Generally, articulation and pronunciation are clear. Most audience members can hear the presentation.	topic, and a willingness to communicate. The vocal tone, delivery style, and clothing are consistent with the message. Delivery style and clothing choices suggest an awareness of expectations and norms. Limited use of nonfluencies is observed. Articulation and pronunciation are clear. All audience members can hear the presentation.

2005. Adapted with permission from Northwest Regional Educational Laboratory (1998).

Area II Competencies – Mathematics

MATH 121 – MATH 1113
MATH 162 – MATH 1614
MATH 180 – MATH 1613
STAT 145 – MATH 2113

Please note: all syllabi for the following courses are in a separate file.

Core Competencies Assessment 2008-2009: Area II Courses

University of New Mexico–Los Alamos **Mathematics – Algebra Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** MATH 121 College Algebra/MATH 1113 Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
1. Students will graph functions Students should: a. Sketch the graphs of linear, higher-order polynomial, rational, absolute value, exponential, logarithmic, and radical functions. b. Sketch a graph using point plotting and analysis techniques, including basic transformations of functions such as horizontal and vertical shifts, reflections, stretches, and compressions. c. Determine the vertex, axis of symmetry, maximum or minimum, and intercepts of a quadratic equation.	The course objectives and student learning outcomes are distributed to all faculty before the beginning of each semester. At the end of the semester, all students are given a comprehensive final examination with correlations between the problems on the exam and the student learning outcomes stated on the syllabus. We have chosen 70% success at the advanced or basic skills mastery to be the benchmark for success. Three learning outcomes from the syllabus were assessed for this competency	***SLO 1*** Advanced Mastery 60% Basic Skills Mastery 36% Progress 2% No Progress 2% ***SLO 3*** Advanced Mastery 45% Basic Skills Mastery 32% Progress 17% No Progress 6% ***SLO 4*** Advanced Mastery 43% Basic Skills Mastery 32% Progress 13% No Progress 11 % There is an average of 82% competency if one counts the advanced and basic skills levels of mastery.	Results were discussed at the beginning of the fall semester so that faculty could make plans. We asked questions such as, "did the test item adequately assess the learning outcome?" "Is the rubric adequate for this use?" "Where do our students need more intense work?" "How will we make these changes?" As a result of this discussion, our rubrics are being revised to better address what is advanced mastery and what is basic skills mastery. This year the mastery on graphing is very good. Faculty decided to continue to emphasize graphing using a textbook that incorporates graphing into most topics. This year we decided that the instrument was adequate for this course learning objective. More training for faculty on how to assess each student will be provided as well as possible cross-grading.	1. Keep a book that emphasizes graphing. 2. Faculty will spend more time on point-plotting and analysis techniques as well as providing extra practice. 3. Faculty will give more practice on graphing parabolas in an effort to improve the ability of students to find vertex, axis of symmetry, max/min of a quadratic function

Core Competencies Assessment 2008-2009: Area II Courses

University of New Mexico–Los Alamos **Mathematics – Algebra Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** MATH 121 College Algebra/MATH 1113 Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
2. Students will solve various kinds of equations. Students should: a. Solve quadratic equations using factoring, completing the squares, the square root method, and quadratic formula. b. Solve exponential and logarithmic equations. c. Solve systems of two or three linear equations. (Continued)	Three learning outcomes from the syllabus were assessed for this competency	***SLO 5*** Advanced Mastery 56% Basic Skills Mastery 25% Progress 13% No Progress 6% ***SLO 9*** Advanced Mastery 31% Basic Skills Mastery 17% Progress 26% No Progress 26% ***SLO 6*** Advanced Mastery 30% Basic Skills Mastery 23% Progress 19% No Progress 26% There is an average of 61% competency if one counts the advanced and basic skills levels of mastery.	We did not meet our goal of 70% mastery at the Advanced or Basic Skills mastery in 2 of the SLOs measured. Students achieved 48% in SLO 9 and 53% in SLO 6 with an average competency of 61%. This was due mainly due to the inability of some students to solve logarithmic equations and use the Fundamental Theorem of Algebra. Faculty decided to try rearranging the order of topics so that logarithms are not always taught in the last part of the semester when students are tired and overloaded. They also decided to strongly emphasize the Fundamental Theorem, giving it more time in the new semester.	1. Rearrange topics in order to put more difficult items earlier in the semester and give them more time. 2. Review often. 3. More concrete examples of the uses of difficult topics such as logarithms 4. Revise the rubric

Core Competencies Assessment 2008-2009: Area II Courses

University of New Mexico–Los Alamos **Mathematics – Algebra Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** MATH 121/MATH 1113 Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
3. Students will demonstrate the use of function notation and perform operations on functions. Students should: a. Find the value of a function for a given domain value b. Add, subtract, multiply, divide and compose functions. c. Determine the inverse of a function. d. Compute the difference quotient for a function. e. Correctly use function notation and vocabulary related to functions, i.e. domain, range, independent variable, of, even symmetry, etc.	Three learning outcomes from the syllabus were assessed for this competency	***SLO 10*** Advanced Mastery 28% Basic Skills Mastery 38% Progress 26% No Progress 6 % ***SLO 12*** Advanced Mastery 45% Basic Skills Mastery 36% Progress 6% No Progress 11 % ***SLO 13*** Advanced Mastery 51% Basic Skills Mastery 17% Progress 21% No Progress 11 % There is an average of 72% competency if one counts the advanced and basic skills levels of mastery.	We did not meet the goal of 70% on SLO 10 (66%) or SLO 13 (68%), Faculty discussed the need for students to be completely fluent in function vocabulary and uses. This includes domains and ranges as well as finding graphical characteristics and inverses. Faculty will consider ways to emphasize these topics and report back at the departmental meeting in early October.	1. Place more emphasis on Functions including vocabulary, finding domains and ranges, finding inverses and operations with functions. 2. Make sure to re-assess these SLOs each semester this year.

Core Competencies Assessment 2008-2009: Area II Courses

University of New Mexico–Los Alamos **Mathematics – Algebra Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** MATH 121/MATH 1113 Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements** .	**(Optional) Recommendations/Goals/Priorities**
4. Students will model/solve real-world problems. Students should: a. Use and understand slope as a rate of change. b. Use equations and systems of equations to solve application problems. c. Apply knowledge of functions to solve specific application problems. d. Solve compound interest problems. e. Solve application problems involving maximization or minimization of a quadratic function. f. Solve exponential growth and decay problems. End – Area II - Algebra	One learning outcomes from the syllabus were assessed for this competency	***SLO 16*** Advanced Mastery 26% Basic Skills Mastery 30% Progress 32% No Progress 10 %	We were unsuccessful in meeting our 70% success rate on SLO 16 achieving only a 56% success. Faculty discussed that while real-world problems are often difficult for students, this should not mean that students cannot learn how to think mathematically and solve problems. Much more effort needs to be spent on this type of problem. More testing should be done. Perhaps more group work and/or projects can be developed this year.	1. More emphasis on modeling and real-world problems. 2. Develop a project or group project for this SLO 3. Consider redesign of syllabus to include more than 1 SLO in this area. Break it apart to reflect the various types of application problems actually covered in Math 121.

Area II-Algebra Assessment completed by _____ **Kay Willerton** **9-23-09**

Signature *Printed Name* *Date*

Phone number **505-661-4697**

Core Competencies Assessment 2008-2009: Area II Courses

UNM–Los Alamos **Mathematics - Calculus I Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Math 162 Calculus I/Math 1614** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
1. Students will demonstrate an understanding of the theoretical, geometrical underpinnings of the calculus. Students should: Algebraically and graphically demonstrate an understanding of: a. Limit b. Tangent line c. Difference quotient d. Fundamental theorem of calculus e. Riemann sums	The course objectives and student learning outcomes are distributed to all faculty before the beginning of each semester. At the end of the semester, all students are given a comprehensive final examination with correlations between the problems on the exam and the student learning outcomes stated on the syllabus. We have chosen 70% success at the advanced or basic skills mastery to be the benchmark for success. Three learning outcomes from the syllabus were assessed for this competency SLO #2 Derivative as a rate of change SLO # 3 Apply 1st and 2nd derivatives to graphing SOL # 4 Fundamental theorem of calculus	***SLO # 2*** 50% Advanced Mastery 15% basic skills mastery 25% progress 5% no progress ***SLO # 3*** 67% Advanced Mastery 20% basic skills mastery 9% progress 4% no progress ***SLO # 4*** 46% Advanced Mastery 40% basic skills mastery 12% progress 2% no progress	Results were discussed at the beginning of the fall semester so that faculty could make plans. We asked questions such as, "did the test item adequately assess the learning outcome?" "Is the rubric adequate for this use?" "Where do our students need more intense work?" "How will we make these changes?" After discussion we determined what steps to take. We did this for all of the Learning outcomes listed for this course. We further determined that the assessment for the year was not adequate. Not enough of the important SLOs were assessed. This will be addressed in academic year 2009-2010. Two of these learning outcomes met the 70% student competency at the basic skills mastery or better, while one did not. The overall average of these three SLOs was 79% success. Faculty still agree that they don't entirely understand the expectations for the various "levels" on the rubric, so more refining and/or training needs to occur before the next assessment is completed. Faculty agreed that more time needs to be spent on the concept of the derivative as a rate of change since this always seems to be a fuzzy area for students.	1. Develop lectures/demonstrations that will make clear the use of derivatives as a rate of change. 2. Revise the descriptions of the levels on the rubric 3. Provide training for faculty in the use of the rubric.

Core Competencies Assessment 2008-2009: Area II Courses

UNM–Los Alamos **Mathematics - Calculus I Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Math 162 Calculus I/Math 1614** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
2. Students will use concepts of function, limit, continuity, derivative, and integral. Students should: Apply the theory of calculus through manipulations involving: a. The finding of limits. b. Using differentiation techniques. c. Working with transcendental & trigonometric functions. d. Determining points of discontinuity and intervals of continuity. (Continued)	Four learning outcomes from the syllabus were assessed for this competency. SLO #1 Limit of a function SLO #7: Mechanics of differentiation SLO #8 Implicit and logarithmic differentiation SLO 9 Integration	***SLO #1*** 58% advanced mastery 21% basic skills mastery 21% progress 0% no progress ***SLO 7*** 36% Advanced Mastery 55% Basis Skills Mastery 2% Progress 7% No progress ***SLO 8*** 72% Advanced Mastery 18% Basic Skills Mastery 9% Progress 1% No Progress ***SLO 9*** 46% Advanced Mastery 41% Basic Skills Mastery 11% Progress 2% No Progress	All of these learning outcomes met the 70% student competency at the basic skills mastery or better. Faculty were concerned that the assessment of SLO # 7 revealed less advanced mastery that they would like to see. They agreed that there is a need to spend more time with students actually working these types of problems with the faculty member or with a tutor. We discussed the need for a "Help Day" for calculus students. Overall, faculty were pleased with the progress in this competency, but discussed the need compare their core final exam to the final exam being given at other institutions.	1. Obtain a copy of the final exam from our main campus and other institutions that would be willing to share. 2. Spend more time with students on the mechanics of differentiation. 3. Encourage students to use the free tutor center.

Core Competencies Assessment 2008-2009: Area II Courses

UNM–Los Alamos **Mathematics - Calculus I Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Math 162 Calculus I/Math 1614** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
3. Students will apply methods of calculus to optimization, graphing, and approximation. Students should be able to: a. Find extreme points. b. Understand the graphs of a function and its 1st and 2nd derivatives and how they relate. c. Apply Newton's method. d. Use differentials to approximate functions.	Two learning outcomes from the syllabus were assessed for this competency. SLO # 10 Apply derivatives to related rates, extrema, graphing SLO # 12 Apply Newton's Method	***SLO 10*** 54% Advanced Mastery 21% Basic Skills Mastery 17% Progress 8% No Progress ***SLO 12*** 20% Advanced Mastery 20% Basic Skills Mastery 50% Progress 10% No Progress	SLO # 10 met the goal of 70% student competency at the basic skills mastery or better. However, SLO 12 did not. After discussing the results of this assessment faculty determined that Newton's Method is not getting adequate coverage. Though all faculty felt they had covered the material well, clearly their students did not. They decided that frequent 1 problem quizzes would be in useful in determining the level of competency that has been obtained.	1. Spend more time teaching Newton's method. 2. Give 1 problem quizzes, muddiest point questions, or other CAT to check for level of understanding
4. Students will apply differential and integral calculus to problems in geometry, physics, and other fields. Students should: a. Understand that calculus has many uses in science, business, and other fields. b. Students should be able to solve application problems involving rates of change, optimization, related rates, and acceleration/velocity. End Area II – Calculus I	No Student Learning Outcomes from this competency were evaluated	This is clearly an area where we failed to perform the necessary assessment. Faculty realized too late that no applications were assessed, even though these type of problems were included on the final examination	Revise the assessment rubric so that it includes application problems Assess applications from a variety of fields.	1. Include application problems to be assessed on the final exam .

Area II-Calculus Assessment completed by _____ **Kay Willerton** **9-23-09**

Core Competencies Assessment 2008-2009: Area II Courses

New Mexico Institution Name UNM–Los Alamos **Mathematics - Calculus I Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Math 180 Elements of Calculus I /Math 1613** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
1. Students will demonstrate an understanding of the theoretical, geometrical underpinnings of the calculus. Students should: Algebraically and graphically demonstrate an understanding of: a. Limit b. Tangent line c. Difference quotient d. Fundamental theorem of calculus e. Riemann sums	The course objectives and student learning outcomes are distributed to all faculty before the beginning of each semester. At the end of the semester, all students are given a comprehensive final examination with correlations between the problems on the exam and the student learning outcomes stated on the syllabus. We have chosen 70% success at the advanced or basic skills mastery to be the benchmark for success. One learning outcomes from the syllabus were assessed for this competency SLO #2 Limits	***SLO #2*** 55% advanced mastery 20% basic skills mastery 10% progress 15% no progress	Results were discussed at the beginning of the fall semester so that faculty could make plans. We asked questions such as, "did the test item adequately assess the learning outcome?" "Is the rubric adequate for this use?" "Where do our students need more intense work?" "How will we make these changes?" After discussion we determined what steps to take. We did this for all of the Learning outcomes listed for this course. We further determined that the assessment for the year was not adequate, though it was an improvement over last year when very little was done. This will be addressed in academic year 2009-2010. This learning outcome met the 70% student competency at the basic skills mastery or better. After discussing the results of this assessment faculty determined that there was no clear understanding of the levels described in the rubric, so though the concept of tool appears to be fine, there needs to be more refining of the descriptions and training of faculty in its use.	1. Revise the rubric 2. Train faculty

Core Competencies Assessment 2008-2009: Area II Courses

New Mexico Institution Name UNM–Los Alamos **Mathematics - Calculus I Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Math 180 Elements of Calculus I /Math 1613** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
2. Students will use concepts of function, limit, continuity, derivative, and integral. Students should: Apply the theory of calculus through manipulations involving: a. The finding of limits. b. Using differentiation techniques. c. Working with transcendental & trigonometric functions. d. Determining points of discontinuity and intervals of continuity. (Continued)	Three learning outcomes from the syllabus were assessed for this competency SLO #5 Find Limits SLO # 8 Find anti-derivatives SLO # 10 Perform elementary integration	***SLO 5*** 40% Advanced Mastery 25% Basis Skills Mastery 23% Progress 12% No porgress ***SLO 8*** 40% Advanced Mastery 0% Basic Skills Mastery 10% Progress 50% No Progress ***SLO 10*** 20% Advanced Mastery 50% Basic Skills Mastery 20% Progress 10% No Progress	Only one of these learning outcomes met the 70% student competency at the basic skills mastery or better. The other two SLOs showed a need for improvement. After discussing the results of this assessment faculty determined that there was a need for more practice in finding limits and integration. However, it was pointed out that this is an applied calculus course where not much emphasis is placed on the concept of limits and that integration is done near the end of the semester with no great emphasis.	1. More practice with limits and integration. 2. Rearrange syllabus to give integration more time.

Core Competencies Assessment 2008-2009: Area II Courses

UNM–Los Alamos **Mathematics – Other College-Level Mathematics Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** **STAT 145 Introductory Statistics/Math2113** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
1. Students will display, analyze, and interpret data. Students should: a. Discriminate among different types of data displays for the most effective presentation. b. Draw conclusions from the data presented. c. Analyze the implication of the conclusion to real life situations.	The course objectives and student learning outcomes are distributed to all faculty before the beginning of each semester. At the end of the semester, all students are given a comprehensive final examination with correlations between the problems on the exam and the student learning outcomes stated on the syllabus. We have chosen 70% success at the advanced or basic skills mastery to be the benchmark for success.	Assessment was conducted by adjunct faculty, and no useable results were received. The faculty members had no clear understanding of how to use the rubric, so even though assessment was done, the results had no obvious correlation to the rubric provided or the state competencies.	Results were discussed at the beginning of the fall semester so that faculty could make plans. As a result of this discussion, the statistics faculty have a better understanding of what is expected of them and how assessment must be completed. More needs to be done with new faculty that come on board, particularly adjunct faculty.	1. Train all faculty in the use of the rubric. 2. Discuss needed changes to the rubric and to the learning outcomes with the faculty members teaching statistics
2. Students will demonstrate knowledge of problem-solving strategies. Students should: a. For a given problem, gather and organize relevant information. b. Choose an effective strategy to solve the problem c. Express and reflect on the reasonableness of the solution to the problem.				

Core Competencies Assessment 2008-2009: Area II Courses **New Mexico Institution Name UNM–Los Alamos Mathematics – Other College-Level Mathematics Competencies, cont.**				
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** **STAT 145 Introductory Statistics/Math2113** Final Exam–Test Item Analysis Rubric and Syllabus with Learning outcomes attached	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional) Recommendations/Goals/Priorities**
3. Students will construct valid mathematical explanations. Students should: Use mathematics to model and explain real life problems.			See above	
4. Students will display an understanding of the development of mathematics. Students should: Recognize that math has evolved over centuries and that our current body of knowledge has been built upon contributions of many people and cultures over time.			See above	
5. Students will demonstrate an appreciation for the extent, application, and beauty of mathematics. Students should: Recognize the inherent value of mathematical concepts, their connection to structures in nature, and their implications for everyday life. End – Area II Other Math			See above	

Area II-Other Math Assessment completed by _____ **Kay Willerton** **9-23-09**

Signature *Printed Name* *Date*

Phone number **505-661-4697**

Area III – Laboratory Sciences

ASTR 101/101L
BIOL 123/124L
CHEM 121/123L – CHEM 1214
CHEM 122/124L – CHEM 1224
EPS 101/105L – EPS 1114
EPS 201L
PHYC 102/102L
PHYC 160 – PHYC 1214
PHYC 161 – PHYC 1224

Please note: all syllabi for the listed courses are being sent in a separate file.

Core Competencies Assessment for Astronomy 101 and Astronomy 101L Lab Courses
UNM-Los Alamos Area III Courses: Laboratory Science Competencies

Instructor: Thomas Beach
Submitted: September 23, 2009

State Competencies	**Assessment Procedures** **ASTR 101 and** **ASTR 101L** Introductory Astronomy Lecture and Lab	**Assessment Results** Data from Summer 2009 ASTR 101: 17 students ASTR 101L: 10 students	**How Results** **Will Be Used To** **Make Improvements**	**Optional** Recommendations/ Goals/Priorities
1. Students will describe the process of scientific inquiry.	This competency is measured using questions regarding the scientific method and what constitutes a 'good' scientific theory in ASTR 101 Test 1.	76% of the students correctly answered the question; 24% did not.	There was only one of these questions on Test 1 in Summer 2009, but future courses will include more such questions to measure this competency.	Implement an additional question on tests during Fall 2009. This will give a breakdown on how many students both, one, or none of the questions correct.
2. Students will solve problems scientifically.	This competency is measured by testing the students understanding of the Doppler shift technique we use in the four of the ASTR 101L labs (Earth's Orbital Velocity, Measuring Solar Rotation, Crab Nebula Expansion, and Hubble's Law).	This was tested in Summer 2009 with a pop quiz on the last day of class regarding the Doppler shift technique. 20% of the students fully understood the method. 30% understood most of the concepts involved. 20% understood parts of the technique. 30% could not explain the technique at all.	In future, this will be measured using a take-home test to see if the students can devise a method for measuring the variation of Saturn's rings with distance from the planet (and how this can prove that the rings are made of separate particles, and are not solid rings).	Implement new take-home quiz in Fall 2009.
3. Students will communicate scientific information.	This competency is measured using the "diagram/short essay" questions that are part of	Of the 51 responses to the various diagram/ short essay questions on the tests:	These questions were not specifically evaluated for clear communication abilities	

	ASTR 101 Tests 1, 2, and 3. The answers to these questions will be evaluated to determine the number of students who can relate all of the concepts, most of the concepts, some of the concepts, and none of the concepts required to answer the questions.	18% were excellent answers that showed mastery of the material; 31% showed good comprehension of the material; 21.5% demonstrated knowledge of some important points of the material; 21.5% showed very poor or no comprehension of the material relating to the question (or were not answered at all).	during earlier courses (they were evaluated solely on content), but in future the aspect of clear communication will be evaluated specifically for this assessment.	
4. Students will apply quantitative analysis to scientific problems.	This competency is measured in ASTR 101 Lab class during the Hubble's Law lab (with questions about how changes in the Hubble constant affect the age of our universe, and what having star clusters of a certain age in our Galaxy constrains the permissible values of Hubble's constant.	Of the 9 students in lab class that day: 22% could do both of the calculations and explain their results; 33% were able to handle and explain one of the calculations; 45% were unable to do the calculations and explain the results without help.	This method involves a "mini-oral quiz" to see if the students understand the calculations.	In future I will also watch as the students who are able to do the questions then help the others learn to do the calculations and explain what the results mean.
5. Students will apply scientific thinking to real world problems.	This competency is measured using questions regarding the "greenhouse effect" and the ozone layer in ASTR 101 Tests 1 and 2, and the future of our Sun in ASTR 101 Test 3.	Earth's greenhouse effect question: 76% correct. 23.5% incorrect. Ozone layer question: 83% correct 17% incorrect.		

		Venus's greenhouse effect question: 71% correct 29% incorrect. Sequence of our Sun's evolution question: 53% completely correct 35% partially correct 18% incorrect.		

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos

Laboratory Science Competencies – BIOL 123/124L

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**Biology for Health Related Sciences and non-majors (Biol 123) + Lab (Biol 124L),** **No NMCCN code** **Spring 2009** Competency 1 is addressed by: 1. Learning outcome (lab): Students will use the scientific method to develop and test a hypothesis. Assessment measure: different test questions throughout the semester – rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average for competency 1: Good understanding: 67% Moderate understanding: 0% Poor understanding: 33%	Students need additional opportunities, such as homework assignments with quick feedback, short in class tests to practice the skills.	
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Competency 2 is addressed by: 1. Learning outcome (lecture): Students will relate observations of natural phenomena to some of the major laws and theories in biology 2. Learning outcome (lab): Students will analyze results in relation to basic principles of biology Assessment measure: different test questions throughout the semester – rubric attached	Good understanding: 67% Moderate understanding: 0% Poor understanding: 33% Good understanding: 75% Moderate understanding: 0% Poor understanding: 25% Overall: Good understanding: 71% Moderate understanding: 0% Poor understanding: 29%	Same as above	

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos Laboratory Science Competencies, - BIOL cont.

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome (lecture): Students will integrate knowledge of cell structure and function in order to critically evaluate a scenario in which a cellular process is disrupted. 2. Learning outcome (lab): Students will communicate scientific information effectively in lab reports. Assessment measure: different test questions throughout the semester – rubric attached	Good understanding: 50% Moderate understanding: 17% Poor understanding: 33% Good understanding: 72% Moderate understanding: 14% Poor understanding: 14% Overall: Good understanding: 61% Moderate understanding: 16% Poor understanding: 23%	Same as above	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcome (lecture): Students will use the Punnett Square method to calculate probabilities that heritable traits will be passed from parents to offspring. 2. Learning outcome (lab): Students will use the metric system, and analyze data via simple calculations and graphical presentations.	Good understanding: 100% Moderate understanding: 0% Poor understanding: 0% Good understanding: 56% Moderate understanding: 44% Poor understanding: 0%	The current approach should be continued.	

	Assessment measure: different test questions throughout the semester – rubric attached	Overall: Good understanding: 78% Moderate understanding: 22% Poor understanding: 0%		
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Competency 5 is addressed by: 1. Learning outcome (lecture + lab): Students will demonstrate understanding of important current issues in biology, and scientific reports in the popular media that relate to them. Assessment measure: different test questions throughout the semester – rubric attached	Overall: Good understanding: 65% Moderate understanding: 10% Poor understanding: 25%	Same as above	

Area III Assessment completed by **Oksana Gerlits** **09/19/09**

Signature ***Printed Name*** ***Date***

Phone number

OUTCOMES ASSESSMENT

BIOL 123: Biology for Health Related Sciences and Non-Majors

Instructor: Susan Schauer Date: Spring Semester, 2009 Total # of students taking course: 12

State Competency:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course Learning Outcomes:

The following outcomes will assess student success in achieving state competencies. The outcomes were chosen to cover some of the most important topics in general biology, not necessarily to cover all the course topics.

1. Students will describe and use the steps of the scientific method to solve a problem. (**S.C. 1**)
2. Students will relate observations of natural phenomena to some of the major laws and theories in biology. (**S.C. 2**)
3. Students will integrate knowledge of cell structure and function in order to critically evaluate a scenario in which a cellular process is disrupted. (**S.C. 3**)
4. Students will use the Punnett Square method to calculate probabilities that heritable traits will be passed from parents to offspring. (**S.C. 4**)
5. Students will demonstrate understanding of important current issues in biology, and scientific reports in the popular media that relate to them. (**S.C. 5**)

Rubric for Grading Outcomes Assessment:

If students average <55% on assessment questions, they understand the topic poorly. If they average 55% to 74% they have a moderate understanding. For >75% they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student provides a complete answer, demonstrates understanding of concept, correct thought processes, organization of information 90% to 100 %	Student demonstrates understanding of the concept and provides most information required. Student could have some minor mistakes. 75% to 89%	Student demonstrates knowledge of the concept but may not be able to put the whole picture together or misunderstands a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions or concepts to a problem Less than 55%

Outcomes Assessment Data:

State Comp-etency	Course Learning Outcome	# / % Students Full Mastery 90-100%	# / % Students Basic Skill Mastery 75-89%	# / % Students Partial Mastery 55-74%	# / % Students No Mastery < 55%
1	1	Not assessed			
2	2	4 / 33%	4 / 33%	0 / 0%	4 / 33%
3	3	6 / 50%	0 / 0%	2 / 17%	4 / 33%
4	4	9 / 75%	3 / 25%	0 / 0%	0 / 0%
5	5	5 / 42%	3 / 25%	1 / 8%	3 / 25%

Assessment Procedures:

The assessed material is covered in the lectures and contained in the textbook and handouts. For each Outcome a set of questions are developed. Questions are designed to have different levels of difficulty. Different Learning Outcomes were assessed on different tests throughout the semester. Below are the assessment tools.

Learning Outcome 1:

Not assessed.

Learning Outcome 2:

What does your body do when you get too hot? Too cold? Use your familiarity with your own body temperature regulation to explain what is meant by homeostasis and negative feedback. You may use a diagram.

Learning Outcome 3:

You are a researcher studying genetic diseases. The cause of a deadly disease has puzzled you for many years. However, you just discovered that patients with the disease have a lysosomal enzyme in brain cells that is missing two amino acids. Explain what missing amino acids might do to the enzyme and how this could cause a disease.

Learning Outcome 4:

Larry has blood type A, and marries Lisa who's blood type is O.

a. What is Larry's genotype if his mother was blood type O?
b. Do a Punnet square to show all the possible genotypes of Larry and Lisa's offspring.
c. What is the probability that their offspring will have type A blood like their father?

d. What is the probability they will have O blood like their mother?

A colorblind man marries a woman who is homozygous for normal color vision.
a. Perform the Punnet square that will show the genotypes of their offspring.
b. What fraction of their children is likely to be colorblind?
c. What fraction of their children is likely to be carriers?
d. What is the sex of the carriers?

Learning Outcome 5:

Discuss why human reproductive cloning is widely considered to be unethical. Include at least three points based on the current state of the technology and scientific understanding.

Discuss the latest breakthrough in stem cell research: the iPS cell. What are the traits of these cells that could make them valuable in medicine? What benefit(s) do they have over embryonic stem cells?

Observations and Action Plan:

LO 1 not assessed
LO 2 4/12 -- 33%
LO 3 6/12 -- 50%
LO 4 0/12 -- 0%
LO 5 4/12 -- 33%

These are the numbers that did NOT reach the basic skill mastery level of 75%. Aside from Learning Outcome 4, they are significant, and indicate a need to increase the opportunities for students to practice these skills during the semester.

OUTCOMES ASSESSMENT

BIOL 124L: Biology for Health Related Sciences and Non-Majors Laboratory

Instructor: Susan Schauer

Date: Spring Semester, 2009

Total # of students taking course: 9

State Competency:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course Learning Outcomes:

1. Students will use the scientific method to develop and test a hypothesis. (S.C. 1)
2. Students will analyze results in relation to basic principles of biology. (S.C. 2)
3. Students will communicate scientific information effectively in lab reports. (S.C. 3)
4. Students will use the metric system, and analyze data via simple calculations and graphical presentations. (S.C.4)
5. Students will critically evaluate scientific reports in the popular media. (S.C. 5)

Rubric for Grading Outcomes Assessment:

If students average <55% on assessment questions, they understand the topic poorly. If they average 55% to 74% they have a moderate understanding. For >75% they have a good understanding.

Full Mastery	Basic skill mastery	Partial mastery	No mastery
	Student demonstrates understanding of the concept and provides most information required. Student could have some minor mistakes. 75% to 89%	Student demonstrates knowledge of the concept but may not be able to put the whole picture together or misunderstands a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions or concepts to a problem Less than 55%
Student provides a complete answer, demonstrates	Student demonstrates understanding of the	Student demonstrates knowledge	Student demonstrates some familiarity with the

understanding of concept, correct thought processes, organization of information 90% to 100 %	concept and provides most information required. Student could have some minor mistakes. 75% to 89%	of the concept but may not be able to put the whole picture together or misunderstands a needed concept. 55% to 74 %	concept but makes multiple mistakes, cannot apply definitions or concepts to a problem Less than 55%

Outcomes Assessment Data:

State Comp-etency	Course Learning Outcome	# / % Students Full Mastery 90-100%	# / % Students Basic Skill Mastery 75-89%	# / % Students Partial Mastery 55-74%	# / % Students No Mastery < 55%
1	1	4 / 44%	0 / 0%	3 / 33%	2 / 22%
2	2	6 / 75%	0 / 0%	0 / 0%	2 / 25%
3	3	1 / 22%	4 / 57%	1 / 22%	1 / 22%
4	4	3 / 33%	2 / 22%	4 / 44%	0 / 0%
5	5	5 / 63%	0 / 0%	1 / 13%	2 / 25%

Note: Some students missed some assessments, so total number assessed doesn't always equal the total number in the class.

Assessment Procedures:

The assessed material is covered in the lectures and contained in the textbook and handouts. For each Outcome a set of questions are developed. Questions are designed to have different levels of difficulty. Different Learning Outcomes were assessed on different tests throughout the semester. Below are the assessment tools.

Learning Outcome 1:

You are a researcher who is developing a vaccine against the deadly West Nile virus. You will administer the vaccine to a group of people living in an area at high risk for West Nile virus. After one year, you will count how many of those vaccinated got the disease.

a. What is your question?
b. What is your hypothesis?
c. Define (describe) your experimental (test) group and your control group.
d. Describe three other variables in your two groups that you will want to control (keep constant).
e. What result would allow you to accept your hypothesis?

Learning Outcome 2:

Draw a pedigree for Tom and Teresa's family. Tongue rolling (T) is dominant to not being able to roll the tongue (t). Start by labeling the pedigree with the phenotypes provided – use one letter inside the circle (female) or square (male). Then when you see patterns, add genotypes below each circle or square.

Teresa can't roll her tongue, but both her parents can. Her two siblings also can roll their tongues. Teresa is married to Tom, who can roll his tongue. One of Tom's parents can roll their tongue but the other can't. His sibling can't roll their tongue. Now, Teresa and Tom have four children. Two can roll their tongue and two can not. From this information, figure out genotypes for Teresa and Tom, their parents, and their four children.

Learning Outcome 3:

Used the third lab report: Enzymes

Learning Outcome 4:

You are a researcher in the early stages of testing enzymes that break down blood clots. One enzyme comes from bacteria, and the other comes from people. When mixed with clotted blood in a test tube, the clot breakdown by these enzymes can be monitored over time by a color change from a deep opaque red color to a pale transparent red color. Use the graph paper to plot the breakdown of blood clots in test tubes at human body temperature (98.6F) over time by the two enzymes. Properly label the axes and the lines on the graph. Provide a descriptive title. Here are the data:

Time (min)	Relative Color of Blood Treated with Bacterial Enzyme	Relative Color of Blood Treated with Human Enzyme
0	Very dark, opaque = +++++	Very dark, opaque = +++++
5	+++++	++++
10	+++++	+++
15	++++	++
20	++++	+
25	+++	Pale, transparent = --
30	+++	--

Learning Outcome 5:

Read the article provided: "Your Lifestyle, Your Genes, and Cancer" from Newsweek. Choose several paragraphs from some part of the article that you find the most interesting – mark the beginning and end of this section with your pen. Write a summary of this section here, using your own words.

OBSERVATIONS AND ACTION PLAN:

LO 1 5/9 -- 56%

LO 2 2/8 -- 25%
LO 3 2/7 -- 29%
LO 4 4/9 -- 44%
LO 5 3/8 – 38%

These are the numbers that did NOT reach the basic skill mastery level of 75%. They are significant, and indicate a need to increase the opportunities for students to practice these skills during the semester.

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies – CHEM 121 / chem. 1214**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**General Chemistry I (Chem 121) + Lab (Chem 123L)** **CHEM 1214** **Fall 2008** Competency 1 is addressed by: 1. Learning outcome (lecture): Structure of the periodic table 2. Learning outcome (lab): Observation and systematization of the effects of experiments Assessment measure: 1. Questions on the final exam 2. Lab report and data analysis on the Boyle's Law experiment Rubric attached.	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average: Good understanding: 53% Moderate understanding: 47% Poor understanding: 0% Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0% Overall: Good understanding: 76% Moderate understanding: 24% Poor understanding: 0%	**Overall plan:** Better emphasize applicability of chemistry to real life problems. More emphasize should be put on report writing as well as connection between lecture material and laboratory practices.	**Overall remark:** All of the students in the class have at least moderate understanding of the chemistry key concepts. Considering that majority of the class is not going to be science majors this is a realistic outcome. Students demonstrated good skills in math (competency 4) slightly poorer results were shown in mastering conceptual problems which also require writing skills (competency 2), but such results have been expected. For most of the students this is very first experience with the science whatsoever and they just started to learn its language and how to use it.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as	Competency 2 is addressed by: 1. Learning outcomes (lecture): Stoichiometry of chemical reactions; Structure of the periodic table; Chemical bonding.	Good understanding: 64% Moderate understanding: 14% Poor understanding: 22%	The question for the 1 learning \ outcome is the overlap of several concepts and some students do not see the connections. More critical thinking problems should be	

microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	2. Learning outcome (lab) Construction and performance of the experiment Assessment measure: 1. Integrative problem on the final exam. 2. Final practical lab exam Rubric attached	Good understanding: 93% Moderate understanding: 7% Poor understanding: 0% Overall: Good understanding: 78% Moderate understanding: 11% Poor understanding: 11%	introduced throughout semester. Although overall the achieved results are good. It would be better to let students to work in teams of two for the final practical exam in the lab. The exercise is good but very lengthy and students are existed at the end.	
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcomes (lecture): Chemical bonding 2. Learning outcome (lab) Graph and interpret measured data Assessment measure: 1. Question on the final exam, which required writing skills. 2. Various lab reports and final practical lab exam Rubric attached	Average: Good understanding: 53% Moderate understanding: 47% Poor understanding: 0% Average: Good understanding: 78% Moderate understanding: 22% Poor understanding: 0%	Results are good overall. But since this is an introductory level in science and a lot of people in the class are not even science majors it would not be wise to expect students to achieve superior write ups. So it would be prudent to minimize the number of formal lab reports (when reports are submitted as separate papers) and spend more time on training how to produce a good quality report. Probably create a special lab exercise for report writing and practice supervised writing.	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcomes: Stoichiometry of chemical reactions 2. Learning outcome: Mathematical analysis of results and evaluate the error in measured data Assessment measure:	Average: Good understanding: 80% Moderate understanding: 20% Poor understanding: 0% Average: Good understanding: 86% Moderate understanding: 14% Poor understanding: 0%	Students have clear understanding of tested concepts. Nothing has to be changed at this time.	

	1. Final exam questions 2. Various lab reports Rubric attached			
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science				

Area III Assessment completed by **Oksana Gerlits** **09/22/09**

Signature ***Printed Name*** ***Date***

Phone number _____

Outcomes assessment plan for Chem 121 lecture
Fall 2008

Instructor: Oksana Gerlits

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving of the state competencies. The outcomes were chosen to cover some of the most important subjects of general chemistry, not necessarily to cover all the course topics.

1. Stoichiometry of chemical reactions: students should be able to balance chemical equations, understand meaning of the coefficients and use dimentinal analysis to perform mass-mole conversions (**competency 2, 4**)
2. Structure of the periodic table: students should know the structure of the periodic table, write correct electron configurations for elements, understand periodic trends of properties for elements in the table and use the periodicity law to predict missing properties (**competency 1, 2**)
3. Chemical bonding: students should describe the types of chemical bonding and distinguish between ionic and molecular compounds, draw correct Lewis structures and discuss, on elementary level, chemical bonding (**competency 2, 3**)

Assessment data collection:

The assessed material covered in the lectures and contained in the textbook. For each outcome a set of workout problems or a multistep problem are developed. Problems are designed to have different levels of difficulty. These problems will be given as part of the final exam. In order to maintain the validity of the questions, the exams will not be given out to the students.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

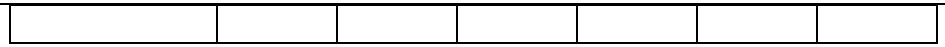
Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work, est.'s 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can workout straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes assessment for Chem 121 lecture (Fall 2008)

Instructor: Oksana Gerlits

Total number of students: 15

<table>
<tr><th>Outcome #</th><th>State Comp. #</th><th>Assessment questions</th><th>Full mast., # of stud.</th><th>Basic mast., # of stud.</th><th>Partial mast., # of stud.</th><th>No mast., # of stud.</th></tr>
<tr><td>1</td><td>4</td><td>1. How many moles are there in 3.20 g of O_2 ?
2. Balance the following chemical reactions with the smallest whole number coefficients:
a) __ $NaOH(aq)$ +__ $H_3PO_4(aq) \rightarrow$ __ $Na_3PO_4(aq)$ + ___ $H_2O(l)$
b) __ $Fe_2O_3(s)$ + ___ $CO(g) \rightarrow$ ___ $Fe(s)$ + __ $CO_2(g)$
c) __ $C_8H_{18}(l)$ + ___ $O_2(g) \rightarrow$ ___$CO_2(g)$ + __ $H_2O(l)$
d) __ $K_3PO_4(aq)$ + __ $Sr(NO_3)_2(aq) \rightarrow$ __ $Sr_3(PO_4)_2(s)$ + __ $KNO_3(aq)$
3. Consider this reaction used for the production of lead:
$2PbO_{(s)} + PbS_{(s)} \rightarrow 3Pb_{(s)} + SO_{2\,(g)}$
What is the mass of Pb that can be obtained by the reaction of 33.80 g of PbO and 57.33 g of PbS?</td><td>11</td><td>1</td><td>3</td><td>0</td></tr>
<tr><td>2</td><td>1</td><td>1. Periodic trends:
i) Which one has the larger radius: a) Al or N; b) O^{2-} or Mg^{2+}
ii) Which one has the greater ionization energy: N or Si
iii) Choose the more metallic element: a) Ge or In; b) B or N
2. Write complete electron configuration for the following atoms or ions. You can use noble gas configuration for the core electrons but use the orbital (box) diagram for the valence shell:
a) Ti^{2+}
b) S
3. Give the complete symbol $^{A}_{Z}X$ for each of these atoms:
a) An element with 20 protons, 20 electrons and 20 neutrons
b) A lead atom with 126 neutrons
4. The densities of the following elements were collected at 25 ^{o}C:
<table>
<tr><td>Element</td><td>He</td><td>Ne</td><td>Ar</td><td>Kr</td><td>Xe</td><td>Rn</td></tr>
<tr><td>Density (g/L)</td><td>0.18</td><td>0.90</td><td></td><td>3.75</td><td></td><td>9.73</td></tr>
</table>
</td><td>2</td><td>6</td><td>7</td><td>0</td></tr>
</table>

		 Estimate the lacking densities				
3	3	1. Describe and explain the differences in the ionic and covalent bonds 2. Consider the following pairs of atoms: N and N; C and B; Si and Si; Cr and Br; C and N; C and O; Ca and O; C and C; Si and O; Group the following pairs of elements into 3 categories according to the type a bond between them and among the pairs with polar covalent bond, determine which is more polar, explain. 3. The cyanate ion $(OCN)^-$ and the fulminate ion $(CNO)^-$ share the same three atoms, but have vastly different properties. The cyanate ion is stable, while the fulminate ion is unstable and forms explosive compounds. a) Draw Lewis structures of both ions including possible resonance structures b) Explain why the fulminate ion is less stable than the cyanate ion (use formal charges)	6	2	7	0
1,2,3	2	Integrative problem*: Phosgene, a gas used in World War I, consists of 12.41 % carbon, 16.17 % oxygen, and 71.69 % chlorine. 1.00 L of this gas at STP has a mass of 4.42 g. Describe the bonding in the phosgene molecule.	0	9	2	3

* Only 14 students participated in the solution of this problem

Observations and action plan:

All of the students in the class have at least moderate understanding of the chemistry key concepts. Considering that majority of the class is not going to be science majors this is a realistic outcome. Students demonstrated good skills in math (outcome 1) slightly poorer results were shown in mastering conceptual problems which also require writing skills (outcome 3), but such results have been expected. For most of the students this is very first experience with the science whatsoever and they just started to learn its language and how to use it.
I also noticed that some students have troubles with interpreting the questions. Example is the integrative question designed for the state competency # 2. This question is the overlap of several concepts and some students do not see the connections. More critical thinking problems should be introduced throughout semester.

Outcomes assessment plan for Chem 121 lecture
Spring 2009

Instructor: Oksana Gerlits

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving of the state competencies. The outcomes were chosen to cover some of the most important subjects of general chemistry, not necessarily to cover all the course topics.

1. Intermolecular forces: students should distinguish between different types of forces and be able to describe how particular intermolecular forces influence different physical properties of chemical substances.
2. Understand and describe physical properties of solutions: students should be able to distinguish between different concentrations and how the concentrations will affect the physical properties of solutions.
3. Chemical kinetics: calculate reaction rates; understand activation energy, reaction mechanisms and catalysis.
4. Chemical Equilibrium: understand the concept of equilibrium, its application to acids, bases, and solubility and the factors that affect chemical equilibria. Apply the concepts involved in Bronsted acids and bases, write acid-base reaction equations, calculate pH; understand how buffer solutions work.

Assessment data collection:

The assessed material covered in the lectures and contained in the textbook. For each outcome a set of workout problems or a multistep problem are developed. Problems are designed to have different levels of difficulty. These problems will be given as part of the final exam. In order to maintain the validity of the questions, the exams will not be given out to the students.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work, est.'s 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can workout straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes assessment for Chem 122 lecture (Spring 2009)

Instructor: Oksana Gerlits

Total number of students: 10

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	2b	1. Intermolecular forces: a) For each pair of compounds, pick the one with the highest boiling point. Explain your reasoning: i) NH_3 or CH_4; ii) CS_2 or CO_2; iii) CO_2 or NO_2 b) Which of the following pair of compounds would you expect to form homogeneous solutions when combined? Explain. i) $CH_3CH_2CH_2CH_2CH_3$ and $CH_3CH_2CH_2CH_2CH_2CH_3$; ii) $LiNO_3$ and H_2O; iii) CH_3CH_2OH and $CH_3CH_2CH_2CH_2CH_3$ c) For each pair of compounds pick the one with the higher vapor pressure at a given temperature. Explain. i) Br_2 or I_2; ii) H_2S or H_2O; ii) CH_3OH or H_2CO	1	6	1	2
2	2a	2. Describe how would you prepare each of the following solutions from the dry solute and water. a) 125 mL of 0.500 M KCl solution; b) 125 g of 0.500 *m* KCl solution; c) 125 g solution of 5.0 % KCl by mass	2	2	6	0
2	4a	3. Calculate the freezing point of the following solutions: a) 5.5 % $NaNO_3$ by mass (in water) b) 55.8 g of glucose ($C_6H_{12}O_6$) in 455 g of water.	6	1	1	2
4	4a	8. 0.25-moles of a weak monoprotic acid with an unknown K_a were dissolved in water to make 80.00 mL solution. The solution was then combined with 5.00 mL of 3.00 M KOH and the resulting solution was diluted to 1.500 L. The measured pH of the solution was 3.85. a) What is K_a of the weak acid? b) Calculate the pH and the percent ionization of the weak sample in the original 80.00 mL sample before the base addition. c) If the acid is titrated to the equivalence point, what is the pH at the equivalence point?	2	4	1	3

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>3</td><td>4. The data below were collected for the following reaction at a certain temperature:
<table>
<tr><td>Time, (h)</td><td>[X_2Y], (M)</td></tr>
<tr><td>1.0</td><td>0.0856</td></tr>
<tr><td>3.0</td><td>0.0664</td></tr>
<tr><td>5.0</td><td>0.0543</td></tr>
</table>
a) Make a plot to show that the reaction is the first order reaction.
b) Using the plot find the initial concentration of X_2Y
c) Determine the value of the rate constant at this temperature
d) What is the half-life for this reaction
e) What is the concentration of X_2Y after 6 hours?

6. Suppose that the reaction A $\rightarrow$ products is exothermic and has an activation barrier of 75 kJ/mol. Sketch an energy diagram showing the energy of the system as a function of the progress of the reaction. Draw a second energy curve showing the effect of a catalyst.</td><td>5</td><td>2</td><td>2</td><td>1</td></tr>
</table>

Observations and action plan:

General chemistry II is more complicated compared to General Chemistry I. A lot of problems require use of calculus elements. Although all students have good skills in math, some of them have a very difficult time to find a correct approach for the solution of a particular problem (outcomes 2 and 4). In future, homework assignments should be given more frequently but smaller in volume these will give opportunity to the teacher to give timely feedback back to students.

Outcomes assessment plan for Chem 123 lab
Fall 2008

Instructor: Oksana Gerlits

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving of the state competencies. The outcomes were chosen to cover some of the basic techniques and subjects of the general chemistry lab, not necessarily to cover all the course topics.

1. Observation and systematization of the effects of experiments (**competency 1**)
2. Construction and performance of the experiment (**competency 2**)
3. Mathematical analysis of results and evaluate the error in measured data (**competency 4**)
4. Graph and interpret measured data: students should be able to briefly discuss the results and draw conclusions using written lab reports (**competency 3**)

Assessment data collection:

Outcomes were assessed on different lab practice exercises and lab reports writing throughout the semester and during practical final lab exam.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate experimental skills. For 75% and more they have good experimental skills.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes lab exercise perfectly including demonstrating understanding of concept, performance of any arithmetic needed and lab report writing, correct thought processes, organization of work, information est.'s Most of the work and analysis is done independently and in time. 90% to 100 %	Student demonstrates understanding of the concept and does most of the experiment independently. Student could have some minor computational mistakes, instructor's suggestions or delayed reports. 75% to 89%	Student demonstrates knowledge of the concept but may not be able to put the whole picture together or misunderstood a needed concept and needs additional instructor's guidance throughout the experiment and data analysis. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes assessment for Chem 123 lab (Fall 2008)

Instructor: Oksana Gerlits

Total number of students: 14

Outcome #	State Comp. #	Assessment procedure	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	1	Lab report and data analysis on the Boyle's Law experiment	11	3	0	0
2	2	Final practical exam: Students were provided with the HCl and NaOH solutions of approximately known concentration and the solid sample of potassium hydrogen phthalate standard and asked to construct and perform an titration experiment to determine the molarities of the provided solutions	6	7	1	0
3	4	Lab reports	6	6	2	0
4	3	Final practical exam	7	4	3	0

Observations and action plan:

Although overall the achieved results are good, for each outcome at least 78 % of students were able to demonstrate basic skill mastery, more emphasis should be put on report writing as well as connection between lecture material and laboratory practices.

Report on Outcomes assessment for Chem 123 lab (Spring 2009)

Instructor: Oksana Gerlits

Total number of students: 9

Outcome #	State Comp. #	Assessment procedure	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	1	Final practical exam: Ability to correctly read and record the experimental data Ability to present the experimental data	7	1	1	0
2	2	Final practical exam: Students were provided with the sample of the unknown acid and standardized NaOH solution and the list with possible acids. After the experiment students should be able to identify an unknown from the list.	7	2	0	0
3	4	Final practical exam: Ability to analyze data Accuracy of the experiment	5	2	2	0
4	3	Final practical exam: Overall report	5	4	0	0

Observations and action plan:

Overall the achieved results are good. More emphasize should be put on report writing as well as connection between lecture material and laboratory practices.

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies – CHEM 122/CHEM 1224**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**General Chemistry II (Chem 122)+ Lab (Chem 124L)** **CHEM 1224** **Spring 2009** Competency 1 is addressed by: 1. Learning outcomes (lab): Observation and systematization of the experimental data Assessment measure: Final practical exam. Rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average: Good understanding: 89% Moderate understanding: 11% Poor understanding: 0%	Overall plan: Put a better balance between homeworks, in-class quizzes and tests. Homework assignments should be given more frequently but smaller in volume this will give opportunity to the teacher to give timely feedback back to students. And number of in-class exams should be increased to cover less tested material per exam.	Working at the branch campus is very different compared to the main campus. Branch campus does not have a lot of core faculty. Very often the same course is taught by different instructors from semester to semester. Each instructor has a different view of assessing the same outcomes and competencies and this makes it very difficult to compare the results of reports for the same subject because they are from different instructors. Right now we are working to develop the same assessment tools to assess the state competencies for the given area. Therefore in future the assessment reports even if they come from different people will be comparable and data gathered will be more systematic and reliable.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative	Competency 2 is addressed by: 1. Learning outcomes (lecture): Intermolecular forces; Understand and describe physical properties of solutions 2. Learning outcome (lab): Construction and performance of	Average: Good understanding: 55% Moderate understanding: 35% Poor understanding: 10% Average: Good understanding: 100%	Put a better balance in homework and exams between calculational and conceptual questions. Better emphasize applicability of chemistry to real life problems	

methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	the experiment Assessment measure: 1.Final Exam questions 2. Practical final lab exam Rubric attached	Moderate understanding: 0% Poor understanding: 0%		

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies, cont. CHEM**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome: Chemical kinetics 2. Learning outcome: Graph and interpret measured data Assessment measure: 1. Questions on final exam 2. Final overall report Rubric attached	Average: Good understanding: 70% Moderate understanding: 20% Poor understanding: 10% Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%	Practice supervised writing, allocate lab time slots for this Probably decrease number of experiments to achieve superior write ups. Experience in lab report writing not only anchors the laboratory concepts but is also first step in learning how to communicate scientific information	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcomes (lecture): Understand and describe physical properties of solutions ; Chemical Equilibrium 2. Learning outcome (lab): Mathematical analysis of results and evaluate the error in measured data Assessment measure: 1. Questions on the final exam 2. Final practical lab exam	Average: Good understanding: 65% Moderate understanding: 10% Poor understanding: 25% Average: Good understanding: 78% Moderate understanding: 22% Poor understanding: 0%	Students have clear understanding of tested concepts. Nothing has to be changed at this time.	

	Rubric attached			
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science				

Area III Assessment completed by **Oksana Gerlits** **09/22/09**

Signature ***Printed Name*** ***Date***

Phone number

Report on Outcomes assessment for Chem 122 lecture (Spring 2009)

Instructor: Oksana Gerlits

Total number of students: 10

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	2b	1. Intermolecular forces: a) For each pair of compounds, pick the one with the highest boiling point. Explain your reasoning: i) NH_3 or CH_4; ii) CS_2 or CO_2; iii) CO_2 or NO_2 b) Which of the following pair of compounds would you expect to form homogeneous solutions when combined? Explain. i) $CH_3CH_2CH_2CH_2CH_3$ and $CH_3CH_2CH_2CH_2CH_2CH_3$; ii) $LiNO_3$ and H_2O; iii) CH_3CH_2OH and $CH_3CH_2CH_2CH_2CH_3$ c) For each pair of compounds pick the one with the higher vapor pressure at a given temperature. Explain. i) Br_2 or I_2; ii) H_2S or H_2O; ii) CH_3OH or H_2CO	1	6	1	2
2	2a	2. Describe how would you prepare each of the following solutions from the dry solute and water. a) 125 mL of 0.500 M KCl solution; b) 125 g of 0.500 *m* KCl solution; c) 125 g solution of 5.0 % KCl by mass	2	2	6	0
2	4a	3. Calculate the freezing point of the following solutions: a) 5.5 % $NaNO_3$ by mass (in water) b) 55.8 g of glucose ($C_6H_{12}O_6$) in 455 g of water.	6	1	1	2
4	4a	8. 0.25-moles of a weak monoprotic acid with an unknown K_a were dissolved in water to make 80.00 mL solution. The solution was then combined with 5.00 mL of 3.00 M KOH and the resulting solution was diluted to 1.500 L. The measured pH of the solution was 3.85. a) What is K_a of the weak acid? b) Calculate the pH and the percent ionization of the weak sample in the original 80.00 mL sample before the base addition. c) If the acid is titrated to the equivalence point, what is the pH at the equivalence point?	2	4	1	3

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a) Make a plot to show that the reaction is the first order reaction.
b) Using the plot find the initial concentration of X_2Y
c) Determine the value of the rate constant at this temperature
d) What is the half-life for this reaction
e) What is the concentration of X_2Y after 6 hours?

6. Suppose that the reaction A $\rightarrow$ products is exothermic and has an activation barrier of 75 kJ/mol. Sketch an energy diagram showing the energy of the system as a function of the progress of the reaction. Draw a second energy curve showing the effect of a catalyst.</td><td>5</td><td>2</td><td>2</td><td>1</td></tr>
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Observations and action plan:

General chemistry II is more complicated compared to General Chemistry I. A lot of problems require use of calculus elements. Although all students have good skills in math, some of them have a very difficult time to find a correct approach for the solution of a particular problem (outcomes 2 and 4). In future, homework assignments should be given more frequently but smaller in volume these will give opportunity to the teacher to give timely feedback back to students.

Outcomes assessment plan for Chem 124 lab
Spring 2009

Instructor: Oksana Gerlits

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving of the state competencies. The outcomes were chosen to cover some of the basic techniques and subjects of the general chemistry lab, not necessarily to cover all the course topics.

1. Observation and systematization of the experimental data (**competency 3**)
2. Construction and performance of the experiment (**competency 2**)
3. Mathematical analysis of results and evaluate the error in measured data (**competency 4**)
4. Graph and interpret measured data: students should be able to briefly discuss the results and draw conclusions using written lab reports (**competency 3**)

Assessment data collection:

Outcomes were assessed on different lab practice exercises and lab reports writing throughout the semester and during practical final lab exam.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate experimental skills. For 75% and more they have good experimental skills.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes lab exercise perfectly including demonstrating understanding of concept, performance of any arithmetic needed and lab report writing, correct thought processes, organization of work, information est.'s Most of the work and analysis is done independently and in time. 90% to 100 %	Student demonstrates understanding of the concept and does most of the experiment independently. Student could have some minor computational mistakes, instructor's suggestions or delayed reports. 75% to 89%	Student demonstrates knowledge of the concept but may not be able to put the whole picture together or misunderstood a needed concept and needs additional instructor's guidance throughout the experiment and data analysis. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Core Competencies Assessment 2008-2009: Area III Courses

UNM-LA **Laboratory Science Competencies** **EPS 101/105L – EPS 1114**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**How the Earth Works – An Introduction to Geology (EPS 101) + Lab (EPS 105L)** **EPS 1114** **Fall 2008** Competency 1 is addressed by: 1. Learning outcome (lecture): Basic geology principles: students should be able to explain the basic principles of how the earth works, i.e. the rock cycle and its relation to plate tectonics Assessment measure: questions on the mid-term and final lecture exams– rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average on competency 1: Good understanding: 62% Moderate understanding: 0% Poor understanding: 38%	Overall plan: Hands-on practice definitely helps. Instructor relates the two parts of the course to the extent feasible during lecture and will try to bring in more hands-on examples to the lecture.	
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods.	Competency 2 is addressed by: 1. Learning outcome (lecture): Geologic processes: students should be able to demonstrate an understanding of geomorphologic processes and the resulting formation of different landforms. 2. Learning outcome (lab):	Average: Good understanding: 61% Moderate understanding: 0% Poor understanding: 39% Good understanding: 57%	Next time the course will be offered animations will be used to help to illustrate the effects of morphological processes on surface landforms. More practice in identifying common rocks and minerals is needed. Students should have	

b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Identify different types of rocks and minerals: students should be able to identify the most common rock-forming minerals and rock types and explain how their presence at an outcrop can be related to a specific earth environment of formation. Assessment measure: Questions on the final and midterm exam– rubric attached.	Moderate understanding: 29% Poor understanding: 14%	access to the laboratory during other hours to be able to reinforce the diagnostic methods used to identify rocks and minerals of different types.	

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies, cont.**
EPS 101/105L – EPS 1114

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome (lab): Identify physical features characteristic of various geologic environments: students should be able to demonstrate an understanding of geomorphologic processes and the resulting formation of different landforms. Assessment measure: Questions on the final lab exam– rubric attached	Average: Good understanding: 76% Moderate understanding: 10% Poor understanding: 14%	The current approach should be continued.	The students in the Laboratory are able to read a simplified geologic map and from it to make a cross-section. In part, this may be the result of identifying this skill as a weakness in 2007 and devoting more time to practice in this area in the 2008 Laboratory.
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific	Competency 4 is addressed by: 1. Learning outcome: Geologic processes (lecture): students should be able to	Average: Good understanding: 92%	Same as above	

observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	demonstrate an understanding of geomorphologic processes and the resulting formation of different landforms. Assessment measure: Questions on the final exam– rubric attached (question #2).	Moderate understanding: 0% Poor understanding: 8%		
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Competency 5 is addressed by: 1. Learning outcome (lecture): Interaction between geology and society: students should be able to demonstrate an understanding of the interaction between geology and society (e.g., geologic hazards, natural resources and energy) Assessment measure: questions on the final exam – rubric attached	Average: Good understanding: 71% Moderate understanding: 20% Poor understanding: 29%	Same as above	

Area III Assessment completed by **Oksana Gerlits** **09/18/09**

Signature ***Printed Name*** ***Date***

Phone number **662-5919 ext 603**

Outcomes Assessment for EPS 101 Lecture
Fall 2008
Instructor: Ardyth Simmons
UNM-LA Campus

State Competencies:
1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:
The following outcomes will assess the success in achieving the state competencies. The outcomes were chosen to cover some of the most important subjects of historical geology, not necessarily to cover all the course topics.
1. Basic geology principles: students should be able to explain the basic principles of how the earth works, i.e. the rock cycle and its relation to plate tectonics **(competencies 1,2,3,5)**
2. Geologic processes: students should be able to demonstrate an understanding of geomorphologic processes and the resulting formation of different landforms. **(competencies 1, 2, 4, and 5)**

3. Interaction between geology and society: students should be able to demonstrate an understanding of the interaction between geology and society (e.g., geologic hazards, natural resources and energy) **(competencies 1,2, 4, and 5)**

Assessment data collection:
The assessed material was covered in the lectures and contained in the textbook and reinforced on one field trip. For each outcome, specific questions were asked on the mid-term and final exams. The questions had different levels of difficulty. In order to maintain the validity of the questions for future use, the final exam was not returned to the students.

Rubric for Grading Outcomes Assessment:
"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work, est.'s 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can workout straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes Assessment for EPS 101 Lecture (Fall 2008)
Instructor: Ardyth Simmons
Total number of students: 12

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	1,2,3,5	1. Which of the following statements is correct? a) North America's east coast is a passive continental margin; b) oceanic ridges are composed largely of granite; c) the deposits of turbidity currents consist of	12	0	0	0

		calcareous ooze; d) the greatest oceanic depths occur at continental rises; e) most of the earth's volcanism occurs at aseismic ridges.				
		2. The Rio Grande Rift is an example of a) a failed mid-ocean ridge; b) a zone of continental collision; c) a zone of continental splitting; d) a mantle hot spot.	8	0	0	4
		3. Which one of the following would most likely be covered with thick turbidite layers? a) the axial rift zone of an active mid-ocean spreading center; b) the upper part of a steep, narrow, submarine canyon; c) a deep-sea fan at the base of a continental slope; d) the ocean floor around a conical shaped seamount.	4	0	0	8
		4. Accretionary wedges are formed a) at the edge of the overriding place facing a subduction zone; b) at the base of a passive continental margin; c) on the oceanic plate side of a transform fault; d) around hot spot volcanoes.	8	0	0	4
		5. Topographically high mountainous areas such as the Himalayas generally a) are underlain by greater than average thicknesses of low density crustal rocks; b) subside rapidly to compensate for erosion; c) have thicker mantle rocks beneath them at shallow depths; d) all of the above.	5	0	0	7
2	1,2,4,5	1. The flow velocity of a stream increases when a) the stream bottom becomes rougher; b) the stream channel widens; c) the stream disappears under ground; d) the stream channel becomes narrower.	12	0	0	0
		2. A stream with a cross-sectional area of 250 m^2 and a flow velocity of 1.5 m/sec has a discharge of ___ m^3/sec. a) 500; b) 125; c) 375; d) 1000; e) 200.	11	0	0	1
		3. Which medium has the greatest capacity to erode? a) running water; b) groundwater; c) glaciers; d) wind; e) waves.	3	0	0	9
		4. Erosional remnants of a shoreline now rising above a wave-cut platform are: a) barrier islands; b) sea stacks; c) beaches; d) marine terraces; e) spits.	7	0	0	5
3	1,2,4,5	1. _____ is considered a nonrenewable resource. a) solar pwer; b) coal; c) water; d) timber.	5	0	0	7
		2. Rapid withdrawal of groundwater can result in: a) a cone of depression; b) ground subsidence; c) loss of hydrostatic pressure; d) all of these.	8	0	0	4
		3. Increasing quantitites of ____ will eventually produce global warming. a) carbon dioxide; b) ozone; c) water vapor; d) nitrogen.	10	0	0	2
		4. When people (especially large populations in cities) interact with geology, what are some of the problems that can occur and how can they be averted or controlled?	10	1	0	1

Observations and action plan:

Two-thirds of the students in the class have a good understanding of the relationship between the rock cycle and plate tectonics. The majority of students have a good understanding of how human interaction with the geologic environment can cause problems and how these problems can be mitigated or controlled. Slightly fewer students have a good understanding of morphological processes, at least for the questions selected. Next semester more questions will be selected from the 6 short-answer quizzes that were given during the semester. Animations will help to illustrate the effects of morphological processes on surface landforms. Those students who demonstrated proficiency in the above topics were invariably the same ones who took the laboratory portion of the course. Hands-on practice definitely helps. I relate the two parts of the course to the extent feasible during lecture and will try to bring in more hands-on examples to the lecture.

Outcomes Assessment for EPS 105L Lab
Fall 2008

Instructor: Ardyth Simmons
UNM-LA Campus

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes included in assessment:

The following outcomes will assess the success in achieving the state competencies. The outcomes were chosen to cover some of the most important subjects of historical geology, not necessarily to cover all the course topics.

1. Identify different types of rocks and minerals: students should be able to identify the most common rock-forming minerals and rock types and explain how their presence at an outcrop can be related to a specific earth environment of formation. This involves understanding the rock cycle. **(competencies 1, 2, 4, and 5)**
2. Identify physical features characteristic of various geologic environments: students should be able to demonstrate an understanding of geomorphologic processes and the resulting formation of different landforms. **(competencies 1, 2, 4, and 5)**

Assessment data collection:

The assessed material for the laboratory section of this course was covered in the twelve laboratory exercises. For each outcome, specific questions were asked on the mid-term and final laboratory exams.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work, est.'s 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can workout straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes Assessment for EPS 105L Lab (Fall 2008)

Instructor: Ardyth Simmons

Total number of students: 7

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	1,2,4,5	1. Identify the rock and mineral specimens provided during 4 laboratory sessions and on the mid-term exam and explain their environment of formation.	1	3	2	1
2	1,2,4,5	1. Demonstrate the ability to read a simplified geologic map (on the final exam) and from the map to construct a simple cross-section.	6	0	0	1
		2. Demonstrate the ability to read a topographic map and interpret various features (questions 22-26 on final exam).	5	1	0	1
		3. Demonstrate the ability to read an actual geologic map of a region and interpret structures and geologic formations (questions 14-16 on final exam).	5	1	0	1

Observations and action plan:

The students in the Laboratory are able to read a simplified geologic map and from it to make a cross-section. In part, this may be the result of identifying this skill as a weakness in 2007 and devoting more time to practice in this area in the 2008 Laboratory. The majority are proficient in reading and interpreting a real geologic map and interpreting structural and outcrop features. The majority are also proficient in reading and interpreting at least certain aspects of topographic maps, based on the test questions. More practice in identifying common rocks and minerals is needed. Although 1/3 of the laboratory time during the semester is spent on this subject, not enough practice happens from week to week. Students should have access to the laboratory during other hours to be able to reinforce the diagnostic methods used to identify rocks and minerals of different types.

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies EPS 201L**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**Earth History (EPS 201L)** **No NMCCN code** **Spring 2009** Competency 1 is addressed by: 1. Learning outcome: Relate plate tectonics to the evolution of life Assessment measure: questions on the mid-term and final lab and lecture exams– rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average on competency 1: Good understanding: 80% Moderate understanding: 20% Poor understanding: 0%	No changes should be made	
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Competency 2 is addressed by: 1. Learning outcome: History of earth history Assessment measure: Questions on the final lab exam– rubric attached.	Average: Good understanding: 80% Moderate understanding: 20% Poor understanding: 0%	No changes should be made	

Core Competencies Assessment 2008-2009: Area III Courses **UNM-Los Alamos Laboratory Science Competencies, EPS cont.**				
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome: History of earth history Assessment measure: a. Oral presentation; b. Exam questions that required the ability to read geologic map and to construct a simple cross-section – rubric attached	Average: Good understanding: 80% Moderate understanding: 20% Poor understanding: 0%	This weakness in the ability to read maps and to construct cross-sections was identified in Spring 2008. As a result more exercises were built into the laboratory in 2009. Some improvement was observed. This approach will be continued. Plus more practice in 3-dimensional visualization, possibly using animations, will be stressed in the next semester this course is offered.	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.				
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research,	Competency 5 is addressed by: 1. Learning outcome: Demonstrate an understanding of earth history as an integrated system Assessment measure: questions on the final exam – rubric attached	Average: Good understanding: 80% Moderate understanding: 20% Poor understanding: 0%	No changes should be made	

cosmology), and ask informed questions about those issues. End – Laboratory Science				

Area III Assessment completed by **Oksana Gerlits** **09/18/09**

Signature ***Printed Name*** ***Date***

Phone number **505-662-5919**

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos **Laboratory Science Competencies PHYC 102**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**General Physics 102 + Lab** **No NMCCN code** **Data shown are combined for Fall 2008 and Spring 2009** Competency 1 is addressed by: 1. Learning objective (lab): Recognition of the basic elements of science and the scientific approach to understanding nature Assessment measure: Lab exercises – rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average: Good understanding: 92% Moderate understanding: 8% Poor understanding: 0%	Overall plan: To improve math skills of students blend more math exercises into the subject. Frequent reviews of the topics to improve students performance on tests. To keep students focused and interested constantly involve them in the class discussions.	
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the	Competency 2 is addressed by: 1. Learning outcome (lecture): Mechanics 2. Learning objective (lab): The students will be exposed to a wide range of physics topics at an introductory level Assessment measure: 1. 3 multiple choice problem and	Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0% Average:	Same as above.	

physical universe and relate them to hierarchically organized explanatory frameworks (theories).	2 work-out problems on Exam 1 – rubric attached 2. 12 lab experiments	Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%		

Core Competencies Assessment 2008-2009: Area III Courses

UNM-LA **Laboratory Science Competencies, cont.**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome (lab): Learn to graph and interpret information from graphs Assessment measure: Experimental reports – rubric attached	Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%		
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcome (lecture): Heat Electricity Magnetism 2. Learning outcome (lab): Using the correct physical model to analyze the data. Assessment measure: 1. Exam 2 questions (6 multiple choice questions and one work-out problem)– rubric attached 2. Experimental results – rubric attached	Average: Good understanding: 81% Moderate understanding: 19% Poor understanding: 0% Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%	Same as above.	

5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Competency 5 is addressed by 1. Learning outcome (lecture): Optics Assessment measure : 1. Exam 3 questions (3 multiple choice questions and one work-out problem)– rubric attached	Average: Good understanding: 81% Moderate understanding: 13% Poor understanding: 6%	Same as above	

Area III Assessment completed by **Oksana Gerlits** **09/19/09**

Signature ***Printed Name*** ***Date***

Phone number

Outcome Assessment for Physics 102 Lecture
Fall 2008
Instructor: Jiaming Morgan
UNM-LA Campus

The Fall 2008 Phyc102 class had a total of 6 students. Three in-class examinations were used to complete the outcome assessment. All three exams were designed to test the students' understanding of basic concepts of physics at an introductory level, and also to test the students' ability of applying those concepts to solve problems. Outcome I is based on Exam 1 which covers Mechanics. Outcome II is based on exam 2 which covers Heat, Electricity and Magnetism. Outcome III is based on exam 3 which covers optics.

Learning Outcomes	Assessment Procedures	The number of Mastery level students		The number of Satisfactory level students (60% - 74%)	The number of Unsatisfactory students (<60%)
		Full (>88%)	Basic (75% - 87%)		
I. <u>Mechanics</u> 1. Newton's three laws of motion. 2. Momentum and its conservation law. 3. Kinetic energy (KE) and Potential energy (PE), Law of energy conservation. 4. Rotational motion. 5. Gravity. 6. Projectile motion.	Exam.1 is a test for mechanics, which includes all the subjects listed in the left block. Overall, all the students did well on Exam1. The average score for this Exam was 89%. All the students scored at least 80% or above. This outcome assessment is based on 4 multiple choice problems: Newton's 1st Law of motion, or the law of inertia, Definition of mechanical equilibrium---static and dynamic (#1.1), Free fall motion, gravitational acceleration (#1.3), PE = $m \times g \times h$ and KE = ½ mv^2 (#2.2) Work = $F \times d$ (#1.6). Also 1 work-out problem: Application of Newton's 2nd Law (#3) Problem #3 was to solve the following: 1) Weight is a force, W = mg 2) Net force 3) $a = F_{net}/m$	4	2	0	0

II. <u>Heat</u> <u>Electricity</u>	This outcome assessment will be based on Exam.2 which covers all the subjects listed in left box. The	Full Mastery	Basic Mastery	Satisfactory	Unsatisfactory

Magnetism 1. Temperature and heat. 2. Heat transfer. 3. 1^{st} and 2^{nd} laws of thermodynamics. 4. Electrostatic: Charges, electrical force and field, and electric potential. 5. Current, electric resistance and voltage. Ohm's Law. Electric circuits. 6. Magnetism: Poles. Cause of magnetism. Magnetic field. Induction.	average score for the Exam.2 is 74%. Since this outcome covers both heat and electromagnetism, I used 6 multiple choice and one work-out problem extracted from Exam 2 for the assessment. 6 multiple choice problems: Absolute temperature, or Kelvin scale (#I.4) 1^{st} law of thermodynamics, $\Delta Q = \Delta U + W$ (#I.5) Exception from thermal expansion---H_2O (#I.11) Electrical force, Coulomb's Law (#II.2) Magnetic field of current-carrying wire (#II. 14) Electromagnetic force (#II.17) One workout problem: Application of Ohms Law, electric power, and circuits(#10) 1) Using I = V/R and P = IV to obtain I, V and R. 2) Circuits in series and parallel.	2	1	3	0
III. Optics 1. Electromagnetic waves, wavelengths and frequencies, speed of electromagnetic wave. 2. Colors. 3. Law of reflection and law of refraction. 4. Lenses, imaging.	The contents for the optics portion is less than previous two outcomes. Assessment is based on Exam 3. The class average was 77%. Three multiple choice problem and one work out problem were used for this assessment. Multiple choice: Electromagnetic waves (I.1) Fermat's least time principle which dominates the law of reflection and refraction (I.14) Three primary colors (I.7) Work-out problem: 1) Refraction index, speed of light in a transparent medium. 2) Law of refraction	2	1	2	1

Overall Assessment	The overall assessment is an average based on three in-class exams.	Full Mastery	Basic Mastery	Satisfactory	Unsatisfactory
		1	3	2	0

Observation and Conclusion:

The overall grades for the students are a combination of three exams, quizzes and homework. Counting all the grading criteria, all 6 students reached at least a basic mastery level.

This course is the introductory level of physics. Most of the students are familiar with some physical phenomena. When the subjects are related to something they have already observed, the class became much more interesting. Overall, the students in this class showed interest in the subjects. They liked to ask questions, and participate in class discussions. The students' interaction with the lecture was very good. I found that more than 90% of the time, the students would response correctly to my questions related to the subjects.

While the students were doing well for the class, they did show their weakness in math, most noticeably algebra (only 2 students had competent math skills). In the future, I may intentionally blend some math skills into the physics subject.

The in-class performance included exams, quizzes, class discussion. The after-class performance included homework. I did notice the students (except one) performed better in-class than after-class. I may need to rely on the in-class performance more for grading in the future.

I feel the class interaction is important to keep students focused and interested. The students seemed less bored if they participated in the class discussions. The downside is that it is time consuming, and the course offered fewer topics. I will try to obtain a better balance in the future.

Assessment completed by _____ Jiaming Morgan 1-6-2009

Signature *Printed Name* *Date*

Phone number 505 662-7729

Outcome Assessment for Physics 102 Lecture
Spring 2009
Instructor: Jiaming Morgan
UNM-LA Campus

The spring, 2009 Phyc102 class had a total of 10 students. Three in-class examinations were used to complete the outcome assessment. All three exams were designed to test the students' understanding of basic concepts of physics at an introductory level, and also to test the students' ability of applying those concepts to solve problems. Outcome I is based on Exam 1 which covers Mechanics. Outcome II is based on exam 2 which covers Heat, Electricity and Magnetism. Outcome III is based on exam 3 which covers optics.

Learning Outcomes	Assessment Procedures	The number of Mastery level students		The number of Satisfactory level students (60% - 74%)	The number of Unsatisfactory students (<60%)
IV. Mechanics 7. Newton's three laws of motion. 8. Momentum and its conservation law. 9. Kinetic energy (KE) and Potential energy (PE), Law of energy conservation. 10. Rotational motion. 11. Gravity. 12. Projectile motion.	Exam.1 is a test for mechanics, which includes all the subjects listed in the left block. Overall, all the students did well on Exam1. The average score for this Exam was 91%. All the students scored at least 77% or above. This outcome assessment is based on 3 multiple choice problems: Newton's 1st Law of motion, or the law of inertia, Definition of mechanical equilibrium---static and dynamic (#1.1), Free fall motion, gravitational acceleration (#1.2), Work = F×d (#1.4). Also 2 work-out problem: Application of Newton's 2nd Law (#3) Problem #3 was to solve the following: 4) Weight is a force, W = mg 5) Net force 3) $a = F_{net}/m$ Problem #4 Conservation of mechanical energy. 1) PE = mgh 2) E = PE + KE	Full (>88%)	Basic (75% - 87%)		
		8	2	0	0

V. <u>Heat</u> <u>Electricity</u>	This outcome assessment will be based on Exam 2, which covers all the subjects listed in left box. The	Full Mastery	Basic Mastery	Satisfactory	Unsatisfactory

Magnetism 7. Temperature and heat. 8. Heat transfer. 9. 1st and 2nd laws of thermodynamics. 10. Electrostatic: Charges, electrical force and field, and electric potential. 11. Current, electric resistance and voltage. Ohm's Law. Electric circuits. 12. Magnetism: Poles. Cause of magnetism. Magnetic field. Induction.	average score for Exam 2 was 83%. Because this outcome covers both heat and electromagnetism, I used 6 multiple choice and one work-out problem extracted from Exam 2 for the assessment. 6 multiple choice problems: Absolute temperature, or Kelvin scale (#I.5) 1st law of thermodynamics, $\Delta Q = \Delta U + W$ (#I.6) Exception from thermal expansion---H_2O (#I.7) Electrical force, charge, Coulomb's Law (#II.1) Magnetic field of current-carrying wire (#II. 15) Electromagnetic force (#II.16) One workout problem: Application of Ohms Law, electric power, and circuits(#II.18(c)) 3) Using I = V/R and P = IV to obtain I, V and R. 4) Circuits in series and parallel.	8	2	0	0
VI. Optics 5. Electromagnetic waves, wavelengths and frequencies, speed of electromagnetic wave. 6. Colors. 7. Law of reflection and law of refraction. 8. Lenses, imaging.	The contents for the optics portion are less than previous two outcomes. The assessment is based on Exam 3. The class average was 80%. Three multiple choice problem and one work out problem were used for this assessment. Multiple choice: Electromagnetic waves (I.1) Fermat's least time principle which dominates the law of reflection and refraction (I.11) Three primary colors (I.5) Work-out problem: 3) Refraction index, speed of light in a transparent medium. 4) Image formation by a thin lens.	5	5	0	0

Overall Assessment	The overall assessment is an average based on three in-class exams.	Full Mastery	Basic Mastery	Satisfactory	Unsatisfactory
		6	4	0	0

Observations and Conclusion:

The overall grades for the students are a combination of three exams, quizzes, and homework. Counting all the grading criteria, all 10 students reached at least a basic mastery level.

This course is the introductory level of physics. Most of the students are familiar with some physical phenomena. When the subjects are related to something they had already observed, the class became much more interesting to the students.

While the students were doing well for the class, they did show weakness in math, most noticeably algebra (only a few students had competent algebra skills). Also, most students were not comfortable with scientific notation. I will keep trying to blend the math skills into the subject with more math exercises in the future

I feel the class interaction is important to keep students focused and interested. The students seemed less bored if they participated in the class discussions. The frequent reviews of the subjects are also important to improve students' performance on the tests. The downside is that this is time consuming, and the course offered fewer topics. I will try to obtain a better balance in the future.

Assessment completed by _____ Jiaming Morgan 5-19-2009

Signature *Printed Name* *Date*

Phone number 505 662-7729

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos Laboratory Science Competencies PHYC 160/PHYC 1214

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**General Physics 160 PHYC 1214, Fall 2008**	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55%	Overall plan: Several students possessed poor math skills, especially in the use of trigonometry and in the interpretation of graphs. Some students struggled with basic algebra. These difficulties were discussed with the head of the math department. Plan: continue to work on math skills during the early weeks of the semester.	
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Competency 2 is addressed by: 1. Learning outcome: Motion with constant acceleration Assessment measure: Exam questions – rubric attached	Average: Good understanding: 66% Moderate understanding: 17% Poor understanding: 17%	Same as above.	
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate				

scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)				
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcome: Newton's Second Law Assessment measure: exam questions – rubric attached	Average: Good understanding: 66% Moderate understanding: 17% Poor understanding: 17%	Same as above.	
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Competency 5 is addressed by 1. Learning outcome: Conservation of Energy and Momentum Assessment measure: Exam questions– rubric attached	Average: Good understanding: 83% Moderate understanding: 0% Poor understanding: 17%	Same as above	

Area III Assessment completed by **Oksana Gerlits** **09/19/09**

Signature ***Printed Name*** ***Date***

Phone number

Outcomes assessment for Physics 160
Fall 2008

Instructor: Michael McNaughton

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving of the state competencies. The outcomes were chosen to cover some of the most important subjects of general physics, not necessarily to cover all the course topics.

1. Motion with constant acceleration: Students will be able to solve problems involving motion with constant acceleration (**competency 2, 4, and 5.**)
2. Newton's Second Law: Students will be able to solve a variety of problems with Newton's second law (**competency 2, 4, and 5.**)
3. Conservation of Energy and Momentum: Students will be able to solve problems involving the Conservation of Energy and Momentum (**competency 2, 4, and 5.**)

Assessment data collection:

The assessed material is covered in the lectures and contained in the textbook. For each outcome a set of workout problems or a multistep problem are developed. Problems are designed to have different levels of difficulty.

Rubric for Grading Outcomes Assessment:

"If students average <55% on a set of three or four questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work. 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can workout straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes assessment for Physics 160 (Fall 2008)

Instructor: Michael McNaughton

Total number of students: 6

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	2,4	A person wearing a seat belt will probably survive a collision if the magnitude of the acceleration is 300 m/s^2. In this case, (a) calculate the distance over which the car comes to rest if the initial speed is 100 km/h, and (b) calculate the force by the seat belt on the person if his mass is 72.0 kg. The attached graph is of the displacement or position, *x*, of a vehicle as a function of time, *t*. Sketch graphs of (a) the corresponding velocity, *v*, as a function of time, *t*, and (b) of the corresponding acceleration, *a*, as a function of time, *t*. During a tennis match, a player serves the ball with a velocity of 23.6 m/s in a direction 5.00 degrees below the horizontal from a height of 2.37 m above the ground (see sketch.) The horizontal distance to the net is 12.0 m. What is the height of the ball when it hits the net? The initial velocity of a car is v_0 = 15.0 m/s in the +*x* direction. a. What is the *x* component, v_{ox}? b. What is the *y* component, v_{oy}? The final velocity of the car is *v* = 15.0 m/s in the +*y* direction. c. What is the *x* component, v_x? d. What is the *y* component, v_y? e. Calculate the change in the *x* component, $v_x - v_{ox}$ f. Calculate the change in the *y* component, $v_y - v_{oy}$ One way to measure the depth of a well is to measure the time for a stone to fall to the bottom. Take the y axis vertically upward and assume the stone is in free fall so its acceleration, a_y = -9.8 m/s^2. a) If the stone is dropped, so it starts from rest, what is its initial velocity, v_{0y}? b) If the stone falls for a time of 1.35 s, calculate the depth, Δy, of the well.	2	2	1	1
2	2,4	A 65-kg person stands on a bathroom scale in an elevator and goes from the first floor up				

		to the tenth floor. (a) Draw a free-body diagram for the person. What will the scale read (b) when the elevator is accelerating upward at 2.00 m/s^2, (c) when the elevator is moving upward at constant speed, and (d) when it is coming to rest at the tenth floor and the magnitude of the acceleration is 3.60 $m.s^2$? A 900-kg car is traveling on a wet horizontal road when a dog runs into the road. The driver applies the brakes to make an emergency stop and the car slides on the wet road. The coefficient of kinetic friction for the tires on the road is 0.25. Note: when a driver applies the brakes, the accelerator is released so the engine does not provide a force in the forward direction. a) Draw a free-body diagram for the car. Label all forces clearly. b) Calculate the weight. c) Calculate the normal force on the car. d) Calculate the friction force on the car. e) Calculate the magnitude of the acceleration of the car. A 5.0-kg ball is suspended from a wire and accelerated upward at 3.0 m/s^2. a) Draw a free-body diagram of the ball. b) Calculate the tension in the wire. You **must** begin with Newton's second law and you **must** show how your method is derived from Newton's second law. A 900-kg car is on a horizontal road. a) What is the weight of this car? Include the units. b) What is the vertical component of acceleration? c) According to Newton's 2^{nd} law, what is the total force, ΣF_y, on this car? d) What are the magnitude and direction of the normal force, n, exerted by the road on the car? e) Draw a free-body diagram showing the forces on the car. What force is required to cause an acceleration of 1.20 m/s^2 to a 900-kg car? Assume there is no friction and the force is applied in the direction of the acceleration.	4	0	1	1
3	2,4	A pump lifts 40.0 kg of water per minute through a height of 2.85 m and ejects the water with a speed of 5.84 m/s. Friction is negligible. What is the power of the pump? A 65.0-kg skier travelling at 13.8 m/s reaches the foot of an upward slope 20° above the horizontal. The snow is dirty and her skis are old so friction is important. She glides 11.4 m up this slope before coming to rest; (note: 11.4 m is the distance measured with a tape placed on the surface of the snow.) (a) How much work is done by the friction in	3	2	0	1

		bringing her to rest? (b) What is the average friction force? You are asked to design an engine or motor to lift a 50-kg object. (a) What power is needed if the object is to be lifted with a velocity of 2.0 m/s? (b) What power would be needed if the velocity is 4.0 m/s? A car engine provides a force of 5,000 N while the car travels a distance of 60 m. The road is horizontal and the friction is negligible. (a) What is the work done on the car? (b) If the car starts from rest, what is its initial kinetic energy? (c) If you ignore friction, what is the final kinetic energy? d) If the mass of the car is 960 kg, what is the final velocity? A 2.0-kg rock is thrown from the roof of a 15.0-m tall building with an initial velocity of 9.0 m/s. You do not need to know the direction. (a) What is its initial kinetic energy? (b) If you choose y_1 = 15.0 m on the roof and y_2 = 0 at ground level, what are its initial and final potential energies? (c) If air resistance is negligible, what is its kinetic energy just before it hits the ground? (d) What is its final velocity? A 6.0-kg mass is suspended at the end of a string. The mass is being lifted at a constant speed of 2.0 m/s through a vertical distance of 5.0 m. a) What is its kinetic energy? (Note: the initial kinetic energy is equal to the final kinetic energy.) b) How much work is done by the string on the mass? c) How much work is done by gravity on the mass? Include the sign.				

Observations and action plan:

Several students possessed poor math skills, especially in the use of trigonometry and in the interpretation of graphs. Some students struggled with basic algebra despite having calculus on their transcripts. Student transcripts did not provide a realistic assessment of the students' math skills. For example, one student received a B in calculus but said she had understood very little of the calculus course. These difficulties were discussed with the head of the math department, who had an opprotunity to observe the students' difficulties during a classroom observation. By the end of the semester, five students had improved their math skills and ultimately achieved either full or basic skill mastery. The sixth student, who is working full time and also preparing for a job-related national certification, was not able to find sufficient time to achieve basic mastery. Plan: continue to work on math skills during the early weeks of the semester.

Core Competencies Assessment 2008-2009: Area III Courses

UNM-Los Alamos Laboratory Science Competencies PHYC 161 – PHYC 1224

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	**General Physics 161, PHYC 1224 Spring 2009** Competency 1 is addressed by: 1. Learning outcome: Heat: Students will be able to solve problems involving the First and Second Laws of Thermodynamics Assessment measure: Exam questions – rubric attached	Good understanding corresponds to scores of 75-100% Moderate understanding corresponds to scores of 55-75% Poor understanding corresponds to scores less than 55% Average on competency 1: Good understanding: 83% Moderate understanding: 17% Poor understanding: 0%	Students have very clear understanding of tested concepts. Nothing has to be changed at this time.	"The student's knowledge and skills have made great strides since the beginning of the first semester. Every year, one of the most encouraging aspects of the first semester is to see the contrast between the students who have competed two semesters of physics and the new batch of incoming students. Every year at the beginning of the first semester, I remind myself of how much they will have progressed by the end of the academic year." Michael McNaughton, the course instructor
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Competency 2 is addressed by: 1. Learning outcome: Electricity: Students will be able to solve problems involving the principles of electricity and Gauss' Law Assessment measure: Exam questions – rubric attached	Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%	Students have very clear understanding of tested concepts. Nothing has to be changed at this time.	

Core Competencies Assessment 2008-2009: Area III Courses UNM-Los Alamos Laboratory Science Competencies, PHYC 161 cont.				
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Competency 3 is addressed by: 1. Learning outcome: Electrical circuits: Students will be able to solve problems involving Ohm's Law and Kirchoff's Laws Assessment measure: exam questions	Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%	Same as above.	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Competency 4 is addressed by: 1. Learning outcome: Magnetism: Students will be able to solve problems involving magnetism and Ampere's Law Assessment measure: exam questions	Average: Good understanding: 83% Moderate understanding: 17% Poor understanding: 0%	Same as above.	
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues.	Competency 5 is addressed by 1. Learning outcome: Induction: Students will be able to solve problems involving induction and Faraday's Law Assessment measure: Exam questions	Average: Good understanding: 100% Moderate understanding: 0% Poor understanding: 0%	Same as above	

End – Laboratory Science				

Area III Assessment completed by **Oksana Gerlits** **09/19/09**

Signature *Printed Name* *Date*

Phone number

Outcomes assessment for Physics 161
Spring 2009
Instructor: Michael McNaughton

State Competencies:

1. Students will describe the process of scientific inquiry.
2. Students will solve problems scientifically.
3. Students will communicate scientific information.
4. Students will apply quantitative analysis to scientific problems.
5. Students will apply scientific thinking to real world problems.

Course outcomes:

The following outcomes will assess the success in achieving the state competencies. The outcomes were chosen to cover some of the most important subjects of general physics, not necessarily to cover all the course topics.

1. Heat: Students will be able to solve problems involving the First and Second Laws of Thermodynamics (**competency 1, 2, 4, and 5.**)
2. Electricity: Students will be able to solve problems involving the principles of electricity and Gauss' Law (**competency 1, 2, 4, and 5.**)
3. Electrical circuits: Students will be able to solve problems involving Ohm's Law and Kirchoff's Laws (**competency 1, 2, 4, and 5.**)
4. Magnetism: Students will be able to solve problems involving magnetism and Ampere's Law (**competency 1, 2, 4, and 5.**)
4. Induction: Students will be able to solve problems involving induction and Faraday's Law (**competency 1, 2, 4, and 5.**)

Assessment data collection:

The assessed material is covered in the lectures and contained in the textbook. For each outcome a set of workout problems or a multistep problem are developed. Problems are designed to have different levels of difficulty.

Rubric for Grading Outcomes Assessment:

If students average <55% on a set of questions, they understand it poorly. If they average 55% to 74% they have a moderate understanding. For 75% and more they have a good understanding.

Full mastery	Basic skill mastery	Partial mastery	No mastery
Student completes problem perfectly including demonstrating understanding of concept, performance of any arithmetic needed, correct thought processes, organization of information and work. 90% to 100 %	Student demonstrates understanding of the concept and solves most of the problems correctly. Student could have some minor computational mistakes. 75% to 89%	Student demonstrates knowledge of the concept can work out straight forward simple problems but may not be able to put the whole picture together or misunderstood a needed concept. 55% to 74 %	Student demonstrates some familiarity with the concept but makes multiple mistakes, cannot apply definitions , equations and concepts to a problem Less than 55%

Report on Outcomes assessment for Physics 161 (Spring 2009)

Instructor: Michael McNaughton

Total number of students: 6

Outcome #	State Comp. #	Assessment questions	Full mast., # of stud.	Basic mast., # of stud.	Partial mast., # of stud.	No mast., # of stud.
1	1,2,4,5	1. You want to cool a drink by adding ice. The drink is 0.355 kg of (mostly) water at an initial temperature of 22°C. The specific heat of both Coke and water is 4190 J/kg·K. You have a supply of ice at an initial temperature of –19°C. The specific heat of ice is 2100 J/kg·K and the heat of fusion of ice is 334×10^3 J/kg. Ignore the container and assume no heat is lost to or gained from outside. If the final temperature of the mixture, after the ice has melted, is to be 0°C, how much ice should you add? 2. Calculate the root-mean-square (rms) speed of a carbon-dioxide molecule at a temperature of 300 K. The mass of a carbon-dioxide molecule is 7.3×10^{-26} kg. The Boltzmann constant is: $k = 1.38 \times 10^{-23}$ J/molecule · K 3. A tire is filled with air at 15°C to a gauge pressure of 1.90×10^5 Pa. If the air in the tire reaches a temperature of 40°C without a change of volume, what will be the air pressure? 4. A gas is enclosed in a cylinder with a piston and is maintained at a constant pressure of 1.11×10^5 Pa. a) Calculate the work done when the volume increases from 2.10 m^3 to 3.90 m^3. b) If 4.9×10^4 J of heat are added during this process, calculate the change of internal energy in the gas. c) Draw a *pV*-diagram of the process. 5. A log cabin is 4.00-m long, 3.00-m wide, and 2.5-m high. The four walls (including window shutters and door) and the flat roof are all 8.00-cm-thick wood with thermal conductivity 0.060 W/m·K. Assume no heat escapes through the floor. The outside temperature is –15°C. What power must be supplied to maintain an inside temperature of 20°C. 6. An optimum (Carnot) refrigerator absorbs heat from the freezer at –20°C and exhausts the heat to the room at 20°C. How much work must be supplied to this refrigerator to change 0.600 kg of water at 20°C to ice at –20°C. The specific heat capacity of water is 4190 J/kg·K; the specific heat capacity of ice is 2000 J/kg·K; and the latent heat of fusion	2	3	1	0

		of ice is 334×10^3 J/kg. 7. A human has a typical heat output of 100 W. If the external temperature is equal to the human body temperature, this heat output is removed by evaporation of sweat. In this case, what mass of water is evaporated as sweat every hour? Assume the heat of vaporization at this temperature is 2.42×10^6 J/kg.				
2	1,2,4,5	8. Two large metal plates have an area of 2.2 m^2 and are separated by 1.50 cm. One plate has a charge of +36.0 nC and the other has a charge of –36.0 nC. a) What is the electric field between the plates? b) What is the electric flux between the plates? c) What is the potential difference between the plates? d) Sketch the field lines. e) sketch the equipotential lines. ϵ_0 = 8.85E-12 $C^2/N \cdot m^2$ 9. A sphere has a radius of 0.10 m and carries a charge of -1 nC. a) Calculate the electric field just outside the surface of the sphere. b) Calculate the electric potential just outside the surface of the sphere. 10. A parallel-plate air capacitor has a charge of magnitude of 0.20 μC on each plate. Each plate has an area of 0.010 m^2, and the plates are 0.30 mm apart. Calculate a) the surface-charge density on each plate; b) the electric field magnitude between the plates; c) the potential difference between the plates; and d) the capacitance. $\epsilon_0 = 8.85 \times 10^{-12}$ $C^2/N \cdot m^2$. 11. a) A 6-μF capacitor and a 2-μF capacitor are connected in parallel and the potential difference across each capacitor is 24 V. Calculate the charge on each capacitor. If the same two capactors are now connected in series, and the total potential difference across the pair is 24 V, calculate b) the charge on each capacitor, and c) the potential difference across each capacitor. 12. A capacitor has a capacitance of 200 pF and is to be operated with a potential difference of 1000 V. The dielectric is mica for which the dielectric constant is 3.00. The maximum electric field allowed in mica (to prevent breakdown) is 2.00 kV/mm. What should be the area of each plate? 12. An oil drop with mass 3.30×10^{-15} kg is held in equilibrium between a pair of large metal plates so the electric force is equal in magnitude and opposite in direction to the gravitational force. The plates are separated by 1.00 cm, and the potential difference between the plates is 337 V. How many excess electrons are on the oil drop? $e = 1.6 \times$	5	1	0	0

		10^{-19} C; $g = 9.8$ m/s^2.				
3	1,2,4,5	13. A circuit consists of a 12.0-V battery, a 22.0-kΩ resistor, and a 0.700-μF capacitor, all in series. The capacitor is initially uncharged and the circuit is completed at time t = 0. a) Calculate the *RC* time constant. b) Calculate the final charge on the capacitor after a long time. c) Sketch the charge on the capacitor as a function of time. d) Calculate the charge on the capacitor at a time t = 30.8 ms. e) Calculate the potential difference across the capacitor at this time. 14. A circuit consists of a 1.5-V battery with negligible internal resistance, a 6-ohm resistor, and an unknown resistor, all in series. The current through the circuit is 0.10 A. a) What is the resistance of the unknown resistor. b) What is the potential difference across the unknown resistor? c) What is the potential difference across the 6-Ω resistor? d) What is the power dissipated in the unknown resistor? e) What is the power supplied by the battery? 15. An electrical circuit consists of a battery with an emf of 60 V and an internal resistance of 2 Ω. The battery is connected across an 8-Ω resistor. a) What is the current in the circuit? b) What is the potential difference across the 8-Ω resistor? c) Graph the potential rises and drops in this circuit 16. The wire in an extension cord is 15.0 m long. It has a cross-section area of 1.20 mm^2. And it is made of copper with resistivity 1.72×10^{-8} Ω·m. (a) Calculate the resistance of the wire. (b) If the wire carries a current of 30.0 A, what is the potential difference between the ends of the wire? (c) In this case, what is the power dissipated in the wire?	4	2	0	0
4	1,2,4,5	17. a) Calculate the velocity of an electron moving in the x direction that passes undeflected through a velocity selector consisting of an electric field of 8.85×10^3 V/m in the y direction and a magnetic field of 4.50×10^{-3} T in the z direction. The magnitude of the charge on an electron is $e = 1.60 \times 10^{-19}$ C. b) An alpha particle has a charge of $+2e$. What is the velocity of an alpha particle that passes undeflected through the same electric and magnetic fields? 18. The Van Allen belt is a region of space where charged particles are trapped moving in circles in the earth's magnetic field of 1.0×10^{-5} T. What is the radius of this circle for a proton with mass 1.67×10^{-27} kg, charge 1.60×10^{-19} C, and speed 1.0×10^6 m/s?	3	2	1	0

		The magnetic moment of a proton = 1.4106×10^{-26} A·m². This is sometimes written 1.4106×10^{-26} J/T. What is the change in energy when a proton is rotated 180° from an initial orientation with its magnetic moment anti-parallel to a 2.5-T magnetic field so that its magnetic moment is parallel to the magnetic field. 19. Two electric power wires are separated by a distance of 1.3 m. Each wire carries a current of 240 A. Calculate the magnetic force by one wire on a 75-m length of the other wire. 20. The magnetic moment of a proton = 1.4106×10^{-26} A·m². This is sometimes written 1.4106×10^{-26} J/T. What is the change in energy when a proton is rotated 180° from an initial orientation with its magnetic moment anti-parallel to a 2.5-T magnetic field so that its magnetic moment is parallel to the magnetic field.				
5	1,2,4,5	21. An *L*-*C* circuit consists of a 950-pF capacitor and a 2.7-mH inductor. a) What is the angular frequency? b) What is the period of oscillation? c) If the peak voltage across the capacitor is 3.3 V, what is the maximum energy stored in the capacitor? d) When all this energy is in the inductor, what is the maximum current in the inductor? 22. A square loop of wire, 0.125 m vertically and 0.125 m horizontally, is moved at a constant speed of 0.670 m/s from a region where the magnetic field is zero into a uniform magnetic field that is confined to a square region with vertical sides. The magnetic field is 1.45 T and is perpendicular to the plane of the loop (parallel to the area vector.) The total resistance around the loop is 0.182 Ω. When the loop is half way into the region of the magnetic field, what is the current in the wire? 23. A coil of wire has 75 turns and each turn has an area of 30 cm^2. The coil is placed flat on a horizontal surface (so that the normal area vector is vertical) in a vertical magnetic field of 1.2 T. The coil is rotated 45° in a time of 0.4 s. What is the average emf induced in the coil? 24. An inductor has an inductance of 0.125 H. The current increases linearly from zero to 1.60 A in a time of 0.400 s. What is the induced emf? 25. A capacitor with capacitance 7.5×10^{-3} F is connected to an inductor with inductance 6.0×10^{-4} H in an *L*-*C* circuit. Calculate a) the angular frequency; b) the frequency in Hz; and c) the period of oscillation.	3	3	0	0

		26. A typical transformer that supplies power to a laptop computer provides 4.5 A at 18 V. If the transformer is 100% efficient, what current does it draw from a 120-V outlet?				

Observations and action plan:

The student's knowledge and skills have made great strides since the beginning of the first semester. Every year, one of the most encouraging aspects of the first semester is to see the contrast between the students who have competed two semesters of physics and the new batch of incoming students. Every year at the beginning of the first semester, I remind myself of how much they will have progressed by the end of the academic year. This past semester, the one student who made marginal progress had major personal problems at the end of the semester. Most students achieved basic mastery of all course outcomes.

AREA IV – Social and Behavioral Science

PSY 105 – PSYC 1113
ECON 105 – ECON 2113

Report Template
Assessment Tools

Core Competencies Assessment 2007-2008: Area IV Courses

New Mexico Institution Name: University of New Mexico – Los Alamos **Social and Behavioral Sciences Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will identify, describe and explain human behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social. systems.	**Psychology 105, SPRING 2009 PSYC1113 – ONLINE COURSE** See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs): Competency 1 is addressed by the following Overarching Outcomes: 1. **Research in Psychology** 2. **Basic Content Mastery** 3. **Application of Knowledge and Critical Thinking in Psychology** Process: Objective exams (4), essays (4), weekly assignments, and weekly discussions	Average of all outcomes incorporating Competency 1: Full Mastery: 64% Partial Mastery: 29% No Mastery: 7% (See attached report for description of methods used.)	See attached report of SLOs for complete description of how results will be used. Summary: INCREASE: • Use of online discussions, and change grading rubric to encourage more focused and interactive discussion. • Use of very brief (less than 5 minutes) video clips to illustrate course navigation and tool use in WebCT. Some students need more guidance at the beginning of the course. • Use of very brief video clips at the beginning of each chapter to introduce the major topics and activities in the chapter. • Use of rubrics for grading. DECREASE • Discontinue using the "Discovering Psychology" video clips, with a few exceptions. They did not appear to add much to the course, and some students had difficulty viewing ½ hour clips online. CONTINUE • Substituting four topical essays for term paper. Improvement from the first to the last essay	

			was clear, suggesting that providing detailed feedback on writing and critical thinking early in the semester was beneficial. • Using short video clips to demonstrate psychological concepts. Students appreciate and remember these. • Asking students to state what stood out for them in each topic, and what concepts gave them difficulty. This gave me valuable feedback and helped them see the relevance of the concepts to their lives. • Giving weekly quizzes online with unlimited opportunities to take them (with randomly selected questions from a larger set). Some students complained, but most thought it helped them study and retain information, and these observations are backed with data from several studies. CHANGE • Look for new ideas for presenting materials and demonstrations in Biological Psychology (including heredity-environment). Biology is not a prerequisite for this course and students with no or a sparse background in biology have a great deal of difficulty understanding the increasingly important concepts in this area.	
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions.	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs): Competency 2 is addressed by: 1. **Research in Psychology** 2. **Basic Content Mastery**	Average of all outcomes incorporating Competency 2: Full Mastery: 64% Partial Mastery: 29% No Mastery: 7%	Same as above, and CONTINUE • The motto of the course, repeatedly emphasized, is "Don't believe everything you think." Students are invited to	

Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world. (Continued)	3. **Application of Knowledge and Critical Thinking in Psychology** Process: Objective exams (4), essays (4), weekly assignments, and weekly discussions		question assumptions, "common sense," beliefs, and values in the context of empirical research and data in psychology.	

Core Competencies Assessment 2007-2008: Area IV Courses

New Mexico Institution Name **Social and Behavioral Sciences Competencies, cont.**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs): Competency 3 is addressed primarily in sub-outcomes dealing with heredity/environment, developmental psychology, emotions and stress, psychopathology, psychotherapy: sub-outcomes 2.2, 2.3, 2.7, 2.8, 2.9, 2.10, 2.11 Process: Objective exams (4), essays (4), weekly assignments, and weekly discussions	All outcomes incorporating Competency 3: Full Mastery: 64% Partial Mastery: 23% No Mastery: 14%	• Same as above, with more emphasis on discussions of issues	
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. – Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs): Competency 4 is addressed primarily in the Social Psychology unit, in examination of research in social influences on behavior (especially experiments of Milgram, Asch, Zimbardo, Darley & Latané) – sub-outcome 3.3	All outcomes incorporating Competency 4: Full Mastery: 72% Partial Mastery: 21% No Mastery: 7%	Same as above	

systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.	Process: Essay exam			

Area IV Assessment completed by _____ **Carol S. Furchner, Ph.D.** **9/15/09**

Signature *Printed Name* *Date*

Phone number 505-662-0331

University of New Mexico – Los Alamos
General Studies Classroom Learning Outcomes Assessment Report
Fall 2008

Class: Psychology 105 – General Psychology **Instructor:** Carol S. Furchner **Number of students:** 19

OVERARCHING OUTCOME 1: RESEARCH IN PSYCHOLOGY
Identify and describe major features and concepts of research in psychology, at an introductory level. This includes the scientific method in general, how psychologists do research, components of an experiment, and why correlation by itself can't be used to infer causation.

OVERARCHING OUTCOME 2: BASIC CONTENT MASTERY
Identify, define and demonstrate understanding at an introductory level of several major content areas within psychology, including biological psychology, heredity/environment, sensation/perception/cognition, learning, memory, lifespan development, social psychology, emotions, stress and health, psychopathology and psychotherapy.

OVERARCHING OUTCOME 3: APPLICATION OF KNOWLEDGE
Demonstrate understanding, ability to write about and work with, and critical thinking skills regarding psychological concepts.

LEARNING OUTCOME EVALUATED	Students Demonstrating:						
	Full mastery #	Partial mastery #	No mastery #	Full mastery %	Partial mastery %	No mastery %	Full or Partial %
OVERARCHING OUTCOME 1: RESEARCH IN PSYCHOLOGY (averages) ***Input: Objective examination questions, evaluating interpretatiosn of psychological research as reported in the popular press. (1,2)***	11	6.6	1.3	58	35	1	**93**
OVERARCHING OUTCOME 2: BASIC CONTENT MASTERY (averages) ***Input: Objective and essay examination questions (1,2,3,4)***	12.8	5.5	0.6	67	29	4	**96**
OVERARCHING OUTCOME 3: APPLICATION OF KNOWLEDGE (averages) ***Input: Term paper, essay examination questions. (1,2,3,4)***	10	6	3	52	32	16	**84**

NOTE: Multiple measures were made on each student for each of the above outcomes, and averaged. Totals and percentages are based on those averages.

NOTE: Numbers in RED next to each of the outcomes listed on this sheet and in subsequent worksheets are NM HED State Competencies from the Core Competencies Assessment 2007-2008: Area IV Courses.

Explanation of Mastery levels:

Full Mastery: For objective questions, student demonstrates clear understanding of the concept and answers correctly at least 85% of target questions checking the outcome. For essay questions and papers, no substantial errors of fact, theory or concept; demonstrates clear thought processes, logical organization, and well-developed critical thinking skills appropriate to an introductory course.

Partial Mastery: For objective questions, student demonstrates adequate understanding of the fundamental elements of the concept and answers 60-85% of the target questions correctly. For essay questions and papers, one or two substantial errors of fact, theory or concept; demonstrates mostly clear thought processes, mostly logical organization, and rudimentary critical thinking skills appropriate to an introductory course.

No Mastery: For objective questions, student demonstrates a lack of understanding of the concept and answers less than 60% of the target questions correctly. For essay questions and papers, several substantial errors of fact, theory or concept; demonstrates muddy thought processes, lacks logical organization, and critical thinking skills not in evidence.

Comments: I give three hourly exams in this class, several assignments and discussions, and a cumulative final exam. In this tally, I include only questions that I consider 'critical evidence of comprehension' of the course material (e.g., a few questions challenge the best students, but these are usually more advanced than I expect most introductory students to be able answer successfully). Since the number of students typically decreases over the semester because some students drop the course between the first and last exams, only outcomes for students who complete the course are reported.

Summary and Conclusions:

Slightly more than half of the students achieved full mastery, by my criteria. One student showed partial mastery or no mastery in all areas, and two students showed only partial mastery or no mastery in most areas. I sometimes wonder if my criteria are too stringent, but I think I've relaxed them over the past seven years, and I know they are much laxer than when I began teaching in 1975. I would like to see more students showing 'full mastery.'

There is a high correlation between students' learning outcomes and grades. But I think that explicitly examining learning outcomes has helped me to identify problem areas, especially biological psychology and sensation and perception. Full mastery improved for Psychotherapy this semester; I used more video clips to illustrate different types of therapies than before. Even though I simplified Sensation and Perception, and I devoted an additional class period to Biological Psychology, these topics are particularly difficult for students who haven't taken biology (or have forgotten what they learned several years before).

I am troubled by the number of students who have difficulty expressing ideas, organizing information, and critically evaluating information in writing. Their number seems to increase each time I teach this course.

Action Plan: What changes will you make, if any, to your teaching methods, your emphasis of topics, etc. the next time you teach this course? What will you continue to do, stop doing, change, or introduce?

- Look for new ideas for presenting materials and demonstrations in Biological Psychology and Sensation and Perception.

Increase:

- Media presentations and discussions in class. Topics where more of this was done showed greater student mastery. Students appreciate short video clips demonstrating psychological concepts.
- Number of assignments requiring writing.

Decrease:

- Time spent lecturing.

Continue:

- Asking students to state what stood out for them in each class/topic, and what concepts gave them difficulty. This gave me valuable feedback and helped them see the relevance of the concepts to their lives.
- Using WebCT for students to access slides used during lectures and supplementary materials. I get a lot of positive feedback from students about having this available.
- Giving weekly quizzes online with unlimited opportunities to take them (with randomly selected questions from a larger set). Some students complained, but most thought it helped them study and retain information, and these observations are backed with data from several studies.
-

Change:

- Substitute four or five topical essays for a term paper. This will give me an opportunity to give the students more feedback about their writing and it will give them an opportunity to show improvement.
- A major change will be teaching the entire course online – planned for Spring 2009. Changes oriented towards a hybrid lecture-online course will be instituted the next time I teach the course that way (probably Fall 2009).

An ongoing challenge: teaching the course with appropriate academic rigor, when some of the students are taking Developmental English, Developmental Math, or are otherwise unprepared for a college-level course. Simplifying the material too much does a disservice to students who are prepared; not simplifying loses the students who are not.

WORKSHEET

LEARNING OUTCOME EVALUATED	Full mastery #	Partial mastery #	No mastery #	Full mastery %	Partial mastery %	No mastery %	Full or Partial %
OVERARCHING OUTCOME 1: RESEARCH IN PSYCHOLOGY **Identify and describe major features and concepts of research in psychology, at an introductory level. This includes the scientific method in general, how psychologists do research, components of an experiment, and why correlation by itself can't be used to infer causation.**							
1.1: Demonstrate understanding of the main features of the scientific method and how and why psychologists use it. ***(1,2)*** ***Questions from Chapter 1, Appendix A***	13	6	0	68	32	0	**100**
1.2: Describe five ways that psychologists do research, and identify the main components of an experiment (IV, DV, experimental group, control group, hypothesis, randomization, operational definition) from a description of a hypothetical or real experiment**.** ***(1,2)*** ***Questions from Chapter 1 , applied questions from most other chapters***	10	7	2	53	37	11	**90**
1.3: Articulate the difference between observing a correlation and concluding causation, and identify misidentification of causation in 'real-life' examples. ***(1,2)*** ***Questions from Chapter 1, applied questions from most other chapters, assignment***	10	7	2	53	37	11	**90**
TOTAL OUTCOME 1	33	20	4				
AVERAGE OUTCOME 1	11	6.6	1.3	58	35	1	**93**
OVERARCHING OUTCOME 2: BASIC CONTENT MASTERY **Identify, define and demonstrate understanding at an introductory level of several major content areas within psychology, including biological psychology, heredity/environment, sensation/perception/cognition, learning, memory, lifespan development, social psychology, emotions, stress and health, psychopathology and psychotherapy.**							
2.1: Define and identify the main concepts underlying biological bases of behavior: neuron, neural transmission, parts and functions of some brain areas, influence of endocrine system, neural plasticity. ***(1)*** ***Objective and Essay Questions from Chapter 2***	11	7	1	58	37	5	**95**
2.2: Demonstrate understanding of the joint contributions of both heredity and environment to the vast majority of behaviors. ***(1,2)*** ***Objective and Essay Questions from Chapter 3***	13	6	0	68	32	0	**100**
2.3: Describe three major theories of psychological development and some of the developmental changes in behavior and cognition that are observed during the first twenty years of life. ***(1,2,3)*** ***Objective and Essay Questions from Chapter 4:***	15	4	0	79	21	0	**100**

LEARNING OUTCOME EVALUATED	Full mastery #	Partial mastery #	No mastery #	Full mastery %	Partial mastery %	No mastery %	Full or Partial %
2.4: Identify some of the transformations that a stimulus undergoes between its form in the environment and our perception of it (sensation and perception). ***(1,2)*** ***Objective and Essay Questions from Chapter5***	10	7	2	53	37	11	**89**
2.5: Describe three major forms of learning, how they differ, and some of the variables that influence them. ***(1,2)*** ***Objective and Essay Questions from Chapter 7***	12	7	0	63	37	0	**100**
2.6: Describe three stages of memory formation, how they differ, and some of the variables that influence formation, loss, and accuracy of memory. ***(1,2)*** Objective and Essay ***Questions from Chapter 8***	12	5	2	63	26	11	**89**
2.7 Describe three theories of emotion and the universality of emotional expression. ***(1,2,3)*** ***Objective and Essay Questions from Chapter 11***	12	7	0	63	37	0	**100**
2.8: Define the stress response, the General Adaptation Syndrome, some of the variables and behaviors which increase or decrease an individual's stress response, and one or two stress management techniques, and how stress and emotions relate to health. ***(1,2)*** ***Objective and Essay Questions from Chapter 11***	12	7	0	63	37	0	**100**
2.9: Define psychopathology, symptoms and theories of cause of some major mental disorders, including mood disorders, anxiety disorders and schizophrenia. ***(1,2,3)*** ***Objective and Essay Questions from Chapter 13***	15	3	1	79	16	5	**95**
2.10: Recognize and define the processes and goals of psychological and biomedical therapies for psychological disorders, several forms of these therapies, evidence-based outcome evaluation. ***(1,2,3)*** ***Objective and Essay Questions from Chapter 14***	15	3	1	79	16	5	**95**
2.11: Describe four major social influences on the behavior of an individual and how these have been demonstrated in the laboratory and in real life; identify some of the variables that influence prejudice and discrimination. ***(1,2,3)*** ***Objective and Essay Questions from Chapter 9***	14	5	0	74	26	0	**100**
TOTAL for OUTCOME 2	141	61	7				
Average for OUTCOME 2	12.8	5.5	0.6	67	29	4	**96**
OVERARCHING OUTCOME 3: APPLICATION OF KNOWLEDGE **Demonstrate understanding, ability to write about and work with, and critical thinking skills regarding psychological concepts.**							

LEARNING OUTCOME EVALUATED	Full mastery #	Partial mastery #	No mastery #	Full mastery %	Partial mastery %	No mastery %	Full or Partial %
3.1: In the term paper and on essay questions, student accurately states the problem, cites facts, data and theories correctly, describes relevant research clearly, critically analyzes the issue, forms a coherent conclusion, and, where required, handles citations correctly and appropriately. ***(1,2,3)*** **Term Paper, Essay questions**	9	7	3	47	37	16	**84**
3.2: Demonstrates the ability to critically evaluate reports of psychological research as described in the popular press. ***(1,2,3)*** **Essay Questions, Assignments**:	9	7	3	47	37	16	**84**
3.3: Demonstrate ability to apply knowledge of social influences on behavior to analyzing behaviors of guards and prisoners in concentration and detention camps. ***(1,2,3,4)*** **Essay Question, Exam 3**	11	5	3	58	26	16	**84**
TOTAL OUTCOME 3	29	19	9				
AVERAGE OUTCOME 3	10	6	3	52	32	16	**84**
OUTCOME 1 (1.1-1.3): Students at each level of achievement (AVERAGE)	11	6.6	1.3	58	35	1	**93**
OUTCOME 2 (2.1-2.11): Students at each level of achievement (AVERAGE)	12.8	5.5	0.6	67	29	4	**96**
OUTCOME 3 (3.1-3.3): Students at each level of achievement (AVERAGE)	10	6	3	52	32	16	**84**
NMHED Competency 1: Average of sub-outcomes	12	6	1	63	32	5	**95**
NMHED Competency 2: Average of sub-outcomes	12	6	1	63	32	5	**95**
NMHED Competency 3: Average of sub-outcomes	74	26		74	26		**100**
NMHED Competency 4: Average of sub-outcomes	11	5	3	58	26	16	**84**

Core Competencies Assessment 2008-2009: Area IV Courses -- Social and Behavioral Sciences Competencies UNM-Los Alamos – Econ 105/2113				
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **ECON 105 Introductory Macroeconomics ECON2113**	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will identify, describe and explain human behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.	**Learning Outcomes:** Individuals completing this course should: Understand basic economic concepts, including: scarcity and choice, opportunity cost, trade concepts, property rights, production possibilities curve, markets, political planning, laws of supply and demand, wage rates, interest rates, exchange rates, price controls, taxation, Laffer curve, public choice, the role of government, and the relationship of government to markets. **Assessment:** **Topics: Supply and Demand, Production Possibilities Curve** Assessed on Final Exam	On the final exam for both semesters, 78% indicated full mastery and 22% indicated partial mastery on questions to Supply and Demand and 94% indicated full mastery on the question related to the Production Possibilities Curve. These results reflect the student's ability to describe and explain behavior using basic economic concepts and tools.	Results indicate a strong understanding of students related to the ability to use economic concepts and tools. The questions on supply and demand were quite challenging and although 78% may seem low, all students had considerable mastery of the material. The various homework assignments will be continued.	Continue to work on fine-tuning the learning outcome and the assessment process to fully capture the intent of the state competency for social and behavioral sciences.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world. (Continued)	**Learning Outcomes:** Individuals completing this course should: Recognize the contributions of key individuals in macroeconomics. **Assessment:** **Topics: Recognize Contributions of Key Individuals** Assessed on Final Exam	On the final exam, 83% indicated full mastery and 17% indicated partial mastery on the question related to contribution of key individuals. These results reflect the student's ability to recognize the contributions of key individuals based on their values, for example Adam Smith vs. Karl Marx, or John Maynard Keynes vs. Milton Friedman	Results were strong with 87% of the students indicated full mastery, yet continued emphasis on key economists and their ideas are important.	Work on fine-tuning the learning outcome and the assessment process to fully capture the intent of the state competency for social and behavioral sciences.

Core Competencies Assessment 2008-2009: Area IV Courses -- Social and Behavioral Sciences Competencies, *cont.*				
State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **ECON 105 Introductory Macroeconomics ECON2113**	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.	**Learning Outcomes:** Individuals completing this course should: Understand basic macroeconomic concepts, including: GDP, consumer price index, economic fluctuations, unemployment, inflation, foreign exchange market, Keynesian model, fiscal policy, banking system, and monetary policy. **Assessment:** **Topics: Fiscal Policy and Monetary Policy** Assessed on Final Exam	On the final exam, 89% indicated full mastery and 11% indicated partial mastery on questions related to *both* Fiscal Policy and Monetary Policy. These results reflect the student's ability to understand the interdependent nature of the individual and society in determining quality of life.	The final exam indicated that 89% of the students had full mastery based on the problems on the exam. Students also completed various homework problems and quizzes related to this material.	Work on fine-tuning the learning outcome and the assessment process to fully capture the intent of the state competency for social and behavioral sciences.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. – Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice. End – Social/Behavioral Sciences	**Learning Outcomes:** Individuals completing this course should: Relate the contents of the course to events and policies occurring in the real economy; e.g. business regulations, social security, inflation, income inequality and poverty, free trade versus protectionism, etc. **Assessment:** **Topics: Economic Growth** Assessed on Final Exam	On the final exam, 83% indicated full mastery and 17% indicated partial mastery. These results reflect the student's ability to evaluate critical issues and evaluate and interpret growth policies.	Even though 83% of the students indicated full mastery, the final exam may not be the best way to assess this learning outcome. Students also completed projects during the semester that could be used to evaluate this outcome with a bit of modification to the project requirements.	Work on fine-tuning the learning outcome and the assessment process to fully capture the intent of the state competency for social and behavioral sciences.

Outcomes Assessment
Economics 105: Macroeconomics
Date: Spring 2009 Students taking exams:18

Learning Outcome	Exam #, Problem on exam	# Students with full mastery	# Students with partial mastery	# Students with no mastery	% Students with full mastery	% Students with partial mastery	% Students with no mastery
Recognize contributions of key individuals	Matching	15	3	0	83	17	0
Understand Supply and demand	C-SA 3	14	4	0	78	22	0
Calculate unemployment statistics	C-SA 4	13	5	0	72	28	0
Definition of econ	C-SA 1	18	0	0	100	0	0
Production possibilities curve	MC 4	17	1	0	94	6	0
Fiscal Policy	C-SA 4	16	2	0	89	11	0
Monetary Policy	C-SA 5	16	2	0	89	11	0
Economic Growth Policies	NM SA1	15	3	0	83	17	0

Summary Observations:

1: Students generally did better on material discussed in the first third of the semester. Perhaps the reinforcement of concepts throughout the semester helped solidify the concepts and tools.

2: Although some scores indicate partially or emerging mastery, most errors on the exams were minor. In class, most students had an appreciation of the contributions of key economists.

3. Another area where most mistakes occurred was in calculating unemployment statistics. Students confused the various formulas.

4. Some students still struggle with the distinction quantity demanded and demand (and related issues with supply).

Action Plan

1. I will spend additional time on the concepts of quantity demanded and demand (and related issues with supply). In addition to the previous homework and article assignments will add more in-class exercise on these topics.

2. Continue to work on exam and quiz questions to accurately assess student performance and understanding.

3. Some of these assessment topics were also tested on Exams 1 and 2. I will work on developing the final exam to target most of the objectives.

4. Give students more written assignments to develop better ways of expressing thoughts as written statements.

AREA V – Humanities and Fine Arts

HIST 102
HIST 162
ARTH 201

Report Template
Assessment Tools

Core Competencies Assessment 2008-2009: Area V Courses

New Mexico Institution Name: UNM-Los Alamos **Humanities and Fine Arts Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will analyze and critically interpret significant and primary texts and/or works of art. Students will demonstrate that they can describe and interpret the key events and general patterns of western civilization from 1648 to the Present with particular attention to the Reformation, the French Revolution, World War I, the Russian Revolution, World War II and the revolutions of 1989	**Hist 102, Spring 2009 Western Civilization** See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency One is addressed by basic content mastery **Process:** Three objective take-home exams.	Average of all outcomes incorporating Competency 1: Full Mastery: 94% Partial Mastery: 6%	• Continue to fine-tune exam questions to reflect course content and goals, especially learning out comes three and four • Continue to emphasize importance of getting help from Tutor Center	
2. Students will compare art forms, modes of thought and expression, and processes across a range of historical periods and/or structures (such as political, geographic, economic, social, cultural, religious, and intellectual). Students will demonstrate they can compare and explain the broad political, economic, social and cultural themes and concepts that define the cultures and events covered in the course.	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 2 is addressed by application of knowledge and critical thinking to analyze historical periods. **Process:** Three objective take-home exams	Average of all outcomes incorporating Competency 2: Full Mastery: 94% Partial Mastery: 6%	Same as above	

3. Students will recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives. \ Students will recognize and articulate the diversity of human experience as presented in the cultures covered in the course and be able to trace their influence(s) on contemporary western civilization. For example, the impact of World War II in changing the course of Russian and German histories. \	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 3 is addressed by application of knowledge and critical thinking to objectively compare and contrast cultures studied in the course and their relation to the same fields (philosophy, drama, art, science, style of warfare) in contemporary society. **Process**: Three objective take-home exams	Average of all outcomes incorporating Competency 1: Full Mastery: 94% Partial Mastery: 6%	Same as above	

4. Students will draw on historical and/or cultural perspectives to evaluate any or all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought. **Competencies, students should possess an understanding of the present that is informed by an awareness of past heritages in human history, arts, philosophy, religion, and literature, including the complex and interdependent relationships among cultures.** Students will recognize and articulate the diversity of human experience as presented in the cultures covered in the course and be able to trace their influence(s) on contemporary western civilization as well as their interaction with one another. For example, the importance of the Reformation on culture, art, religion and literature from the 16th century to present day. \	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 4 is addressed by application of knowledge and critical thinking to objectively, logically and accurately compare and contrast cultures studied in the course and relate how they interacted with one another and how they have affected contemporary society. **Process**: Three objective take-home exams	Average of all outcomes incorporating Competency 1: Full Mastery: 94% Partial Mastery: 6%	Same as above	

Area V Assessment completed by _____ Melanie V. Shirk, Ph. D. 9/17/09

Signature *Printed Name* *Date*

Phone number **505-662-6367**

Core Competencies Assessment 2008-2009: Area V Courses

New Mexico Institution Name: UNM-Los Alamos **Humanities and Fine Arts Competencies**

State Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** **Course Name and NMCCN** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**	**(Optional)** Recommendations/Goals/ Priorities
1. Students will analyze and critically interpret significant and primary texts and/or works of art. Students will demonstrate that they can describe and interpret the key events and general patterns of United States history from Reconstruction to the present day with particular attention to important presidents like Theodore Roosevelt and important reform movements like civil rights.	**Hist 162, Spring 2009** **US History after 1877** See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency One is addressed by basic content mastery **Process:** Three objective take-home exams.	Average of all outcomes incorporating Competency 1: Full Mastery: 100% Partial Mastery: 0%	• Continue to fine-tune exam questions to reflect course content and goals, especially learning outcomes three and four • Continue to emphasize importance of English skills	
2. Students will compare art forms, modes of thought and expression, and processes across a range of historical periods and/or structures (such as political, geographic, economic, social, cultural, religious, and intellectual). Students will demonstrate they can compare and explain the broad political, economic, social and cultural themes and concepts that define the important events of	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 2 is addressed by application of knowledge and critical thinking to analyze historical periods. **Process:** Three objective take-home exams	Average of all outcomes incorporating Competency 2: Full Mastery: 100% Partial Mastery: 0%	Same as above	

United States history covered in the course.				
3. Students will recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives. \ Students will recognize and articulate the diversity of human experience as presented in the cultures covered in the course and be able to trace their influence(s) on contemporary American culture. For example, the importance of the civil rights movements on law, culture, entertainment and politics. \	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 3 is addressed by application of knowledge and critical thinking to objectively compare and contrast cultures studied in the course and their relation to the same fields (philosophy, drama, art, science, style of warfare) in contemporary society. **Process**: Three objective take-home exams	Average of all outcomes incorporating Competency 3: Full Mastery: 100% Partial Mastery: 0%	Same as above	

4. Students will draw on historical and/or cultural perspectives to evaluate any or all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought. **Competencies, students should possess an understanding of the present that is informed by an awareness of past heritages in human history, arts, philosophy, religion, and literature, including the complex and interdependent relationships among cultures.** Students will recognize and articulate the diversity of human experience as presented in the cultures covered in the course and be able to trace their influence(s) on contemporary American civilization as well as their interaction with one another. For example, the importance of the civil rights movements on law, culture, entertainment, and politics.	See attached Classroom Learning Outcomes Assessment Report of Student Learning Outcomes (SLOs). Competency 4 is addressed by application of knowledge and critical thinking to objectively, logically and accurately compare and contrast cultures studied in the course and relate how they interacted with one another and how they have affected contemporary society. **Process**: Three objective take-home exams	Average of all outcomes incorporating Competency 1: Full Mastery: 100% Partial Mastery: 0%	Same as above	

Area V Assessment completed by _____ Melanie V. Shirk, Ph. D. 9/17/09

Signature *Printed Name* *Date*

Phone number **505-662-6367**

LA ARTH 202
300 **History of Art II**
Spring 2009
Assessment: The University of New Mexico-Los Alamos

This course is a study and analysis of art and architecture from the sixteenth through the twentieth centuries with an emphasis on the history of artwork produced in Western Europe and the United States. Artistic styles and stylistic change relative to the visual character of art objects from the Renaissance, Baroque, Rococo, Enlightenment, Romantics, Realists, Impressionists and the 20th century are examined.

LEARNING OUTCOMES

At the conclusion of this course the student can

1. identify and describe significant artworks, artists and their cultural affiliation.

2. demonstrate an understanding of the terminology associated with individual artists, singular artworks, specific art movements and particular styles of art and architecture.

3. understand the history of styles and stylistic changes relative to the vision and achievements of individual artists and patrons.

4. associate art terminology with the style or work of an individual artist.

5. articulate an appreciation and comprehension of the cultural context of art and architecture.

Learning Outcomes will be tested in the midterm and final exams. The final exam will be used to determine the efficacy of classroom instruction regarding learning outcomes. The exams consist of four separate **sections** that correlate directly with the five learning outcomes:

Section
One: Forty questions - identification of artworks, artists & affiliation (outcome #1)
Two: Twenty questions - art terminology (outcome #2)
Three: Fifteen questions - associate terminology with style & artist (outcome # 4)
Four: One essay question - written account of an artist's record of achievement and personal vision relative to the historical context of the work itself (outcomes #3 & #5)

OUTCOMES ASSESSMENT
ARTH 202: History of Art II
Date: Spring Semester, 2009
Total # of students taking final exam: 6

Learning Outcome	Question numbers on exam	#Students full mastery	#Students partial mastery	#Students no mastery	%Students full mastery	%Students partial mastery	%Students no mastery
identify artworks	**section 1** one through forty	3	3	0	50%	50%	0%
art terms	**section 2** forty one through sixty	3	3	0	50%	50%	0%
associate terms with styles & artists	**section 3** sixty one through seventy five	4	2	0	66.6%	33.3%	0%
essay: art and context	**section 4** seventy six: essay	5	1	0	83.33%	16.66%	0%

SUMMARY/OBSERVATIONS:

1. During the course of the semester, students view over one thousand artworks. Artists and architects are represented by one or two images directly correlated to the text for this course. Additionally, students view a number of slides, internet images and films on art-works not pictured in the textbook. The

class is successful at identifying singular artworks by individual artists and architects, fifty percent of the class possessing full mastery in this category and fifty percent of the class demonstrating partial mastery of this learning outcome.
2. Students are required to know over 150 terms used in defining styles or types of artworks. Many of these terms define highly specific techniques and methodologies relative to studio practice in the arts. Other terms relate to terminology associated with architecture or a particular culture. Half of the class demonstrates a comprehensive understanding of the terms associated with the subject. Half the class demonstrates a partial understanding of Art History terminology.
3. Invariably, these terms are directly linked to individual artists, styles and art movements. Comprehending and understanding the relationship between terminology, artists, styles and movements is one of the more challenging aspects of this course. In the final exam, two thirds of the class mastered this aspect. One third of the class demonstrated partial mastery in associating terms with styles and artists.
4. Students are permitted to select one question from a list of three for the essay portion of the final test. During class, a review is conducted outlining the general parameters of each essay question. Students perform very well in this particular format and most of them (83 %) demonstrate complete mastery in this section of the test.

ACTION PLAN FOR NEXT SEMESTER:

1. Combining slides, internet images and films in class that directly relate to the images in the textbook is effective in teaching students to identify artworks and architecture associated with individual artists and architects. Emphasis on important artworks that established benchmarks in the field of Art History should continue. Additional dialogue with the class (new this semester) is effective in assessing student understanding of the cultural and historical significance of particular works. Informal presentations on artworks by students is interesting and creates an intellectual bond in the class. Building on this dialogue is a primary goal for next semester. Additionally, many more images of significant architectural sites will be utilized during class - allowing the class to make virtual trips through these sites. A number of significant works of architecture now feature graphic indexes of building sites that include virtual imagery of the building(s). Many museums have created special indices to their collections that allow virtual examination of singular works and comparative analysis of works by different artists. Every effort should be made to bring these resources to the attention of the class.
2. Cultural affiliation, stylistic affinity and social significance are equally important in understanding the creation and subsequent preservation of works of art. The suggestion to instigate a review and discussion session (of the previous class) is proving itself to be a difficult proposition. Class discussions during these reviews are lacking in animated dialogue. Perhaps it is better to include small 'snippets' of information from the previous class as the opportunity presents itself. The conversion of the slide collection to high-resolution TIF files (which occurred this year) is enabling the class to review presentations in a more efficient and thorough format. TIF files - stored on DVD's - are available for review in the UNM-LA library for students. For students at the Bernalillo site, DVDs of the slide collection will soon be available for viewing during office hours.

3. Additional emphasis on understanding the relationship between terminology, artists, styles and movements is needed. Current handouts of terms were edited to include information regarding these relationships. Unexpectedly, it seems that increased classroom conversation and dialogue is very effective in helping students understand the relationship between terms, styles and artists. Or, perhaps I am becoming more aware of what they know - during the class sessions.
4. The current selection of DVD films in the Art Department's collection is outstanding. These films are an integral part of the Art History class and will be donated to the UNM-LA library to guarantee wider access to this resource. The films have been selected for their accuracy in communicating complex visual ideas in a visual format. This helps the student in developing a clear understanding of the physical nature of the artwork being examined. However, students at the Sandoval County site are unable to access this collection directly and must use the UNM-LA library to review these films. Also, internet access is not available at off-campus sites. Moving the class to the Sandoval County Townsite should improve the quality of instruction and contribute to class discussion.