Weber State University Biennial Report on Assessment of Student Learning

Cover Page

Department/Program: Medical Laboratory Sciences

Academic Year of Report: 2018/19 (covering Summer 2017 through Spring 2019)

Date Submitted: November 15, 2019

Report author: Matthew Nicholaou, DrPH, MT(ASCP)

Contact Information:

Phone: 801-626-6101

Email: matthewnicholaou@weber.edu

A. Brief Introductory Statement:

Please review the Introductory Statement and contact information for your department or academic program displayed on the assessment site: http://www.weber.edu/portfolio/departments.html - if this information is current, please place an 'X' below. No further information is needed.

___ Information is current; no changes required.

Update if not current: The statement is fine, but please update the contact information to replace Janet Oja with Janice Thomas who is the new program director.

Janice Thomas Program Director 3875 Stadium Way, Dept 3905 Ogden, UT 84408-3905 Marriott Health Bldg, Rm 209 (801) 626-8138

B. Mission Statement

Please review the Mission Statement for your department or academic program displayed on the assessment site:

http://www.weber.edu/portfolio/departments.html - if the mission statement is current, please place an 'X' below.; If the information is not current, please provide an update:

X Information is current; no changes required.

Update if not current:

C. Student Learning Outcomes

Please review the <u>Student Learning Outcomes</u> for your academic program displayed on the assessment site: http://www.weber.edu/portfolio/departments.html. In particular, review in light of recent strategic reporting and indicate any needed updates. If the outcomes are current, mark below.

X Information is current; no changes required.

Update if not current:

D-1. Curriculum

"A collection of courses is not a program. A curriculum has coherence, depth, and synthesis." (Linda Suskie; presentation at NWCCU Assessment Fellowship, June 19, 2019)

Please review the <u>Curriculum Grid</u> for your department or academic program displayed on the assessment site: http://www.weber.edu/portfolio/departments.html.

Indicate in the curriculum grid where graduating student performance is assessed for each program outcome. In the 'additional information' section, please provide information about these assessments (e.g., portfolios, presentations, projects, etc.) This information will be summarized at the college and institutional level for inclusion in our NWCCU reporting on student achievement.

Curriculum Map Format

Core Courses	Learning Outcomes							
	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
MLS 1010 Core Clinical Laboratory Skills	Α	U	Α	Α	E	U	Α	E
MLS 1001 Online Orientation for AAS Degree*	NA	NA	NA	NA	NA	NA	E	E
MLS 1113 Introduction to Laboratory Practices	Α	U	Α	Α	E	U	Α	Е
MLS 1114 Principles of Hematology and Hemostasis	Α	Α	Α	Α	E	Α	E	Е
MLS 2211 Principles of Clinical Chemistry I	Α	Α	Α	U	E	U	U	U
MLS 2212 Principles of Clinical Microbiology I	Α	U	Α	U	U	Α	U	U
MLS 2213 Principles of Clinical Chemistry II	Α	Α	Α	U	Е	U	U	U
MLS 2214 Principles of Clinical Microbiology II	Α	U	Α	U	U	Α	U	U
MLS 2210 Principles of Clinical Immunohematology	Α	U	Α	Α	Α	Е	Е	Е
MLS 3301 Online Orientation for BS Degree*	NA	NA	NA	NA	NA	NA	Е	E
MLS 3302 Biostatistics, Research Methods, and Laboratory Practices	Α	Α	NA	U	U	NA	Е	Α
MLS 3310 Advanced Immunohematology	Α	U	Α	Α	Α	E	E	E
MLS 3312 Clinical Immunology and Virology	Α	U	Α	U	I	Е	1	E
MLS 3313 Advanced Hematology and Hemostasis	Α	Α	Α	Α	Е	Α	Е	Е
MLS 3314 Advanced Clinical Chemistry	Α	U	I	Е	Α	Α	U	Е
MLS 3316 Advanced Clinical Microbiology and Molecular Diagnostics	Α	U	Α	U	Α	Α	U	U
MLS 4409 Clinical Correlation	Е	I	NA	I	E	Α	U	NA
MLS 4410 Interdisciplinary Healthcare Teams	U	U	NA	U	E	Е	Α	Α
MLS 4411 MLS Simulated Laboratory I	U	U	Α	U	Α	U	Α	Α
MLS 4412 MLS Simulated Laboratory II	U	Α	U	U	Е	NA	U	Α
MLS 4415 Laboratory Teaching and Supervision	NA	NA	NA	NA	U	NA	Α	Α
MLS 4803 Research Projects in MLS I	U	U	E	E	NA	NA	Α	Α
MLS 4804 Research Projects in MLS II	Α	А	Α	Α	Α	U	А	Α

Program Outcomes

- 1. Knowledge Goal: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.
- 2. Knowledge Goal: Apply mathematical calculations to laboratory situations.
- 3. Laboratory Skill: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.
- 4. Laboratory Skill: Correlate laboratory theory and terminology to practical laboratory work.
- 5. Laboratory Skill: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.
- 6. Diagnostic Skill: Relate laboratory findings to common disease processes.
- 7. Professionalism and Ethics: Demonstrate professional conduct and ethical behavior.

8. Communication Skill: Demonstrate effective communication skills and behaviors with colleagues in the program and in a laboratory setting.

Key:

I=Introduced

E = Emphasized

U = Utilized

A = Assess comprehensively

NA = Not Addressed

Additional Information (details about graduating student assessment):

The main graduating student assessments used by the Department of Medical Laboratory Sciences are certification exam scores and post-graduation placement rates defined as: The number who found employment (in the field or related field) and/or continued their education within one year of graduation. Below is a table of annual rates from 2016 to the most recent data for 2019.

Academic Year	Numbered		G	Graduation		BOC Certification		Placement Rates	
	of stu	dents enrolled		Rates		Pass Rates			
	MLT	MLS	MLT	MLS	MLT	MLS	MLT	MLS	
2018-19	361	427	100%	100%	N/A	N/A	100%	100%	
2017-18	112	120	97%	98.5%	95%	84%	100%	100%	
2016-17	113	123	97%	98.5%	88%	92%	100%	100%	

D-2. <u>High Impact Educational Experiences</u> in the Curriculum

In response to the recent USHE requirement that all students have at least 1 HIEE in the first 30 credit hours and 1 HIEE in the major or minor we are asking programs to map HIEEs to curriculum using a traditional curriculum grid. This helps demonstrate how and where these goals are accomplished.

Core Courses	High Impact Educational Experiences (HIEE)							
	HIEE 1	HIEE 2	HIEE 3	HIEE 4	HIEE 5	HIEE 6	HIEE 7	HIEE 8
MLS 1010 Core Clinical Laboratory Skills	Т	I	F	NA	NA	NA	F	Т
MLS 1001 Online Orientation for AAS Degree*	NA	NA	NA	NA	NA	NA	NA	NA
MLS 1113 Introduction to Laboratory Practices	Т	I	F	NA	NA	NA	Т	Т
MLS 1114 Principles of Hematology and Hemostasis	Т	l	F	NA	NA	NA	Т	Т
MLS 2211 Principles of Clinical Chemistry I	Т	I	F	NA	NA	NA	Т	Т
MLS 2212 Principles of Clinical Microbiology I	Т	l	F	NA	NA	NA	Т	Т
MLS 2213 Principles of Clinical Chemistry II	Т	l	F	NA	NA	NA	Т	Т
MLS 2214 Principles of Clinical Microbiology II	Т	I	F	NA	NA	NA	Т	Т
MLS 2210 Principles of Clinical Immunohematology	Т	l	F	NA	NA	NA	Т	Т
MLS 2256 Supervised Clinical Experience I	Т	Т	Т	I	F	NA	Т	1
MLS 2257 Supervised Clinical Experience II	Т	Т	Т	I	F	NA	Т	I
MLS 3301 Online Orientation for BS Degree*	NA	NA	NA	NA	NA	NA	NA	NA
MLS 3302 Biostatistics, Research Methods, and Laboratory Practices	I	1	F	NA	NA	NA	Т	F
MLS 3310 Advanced Immunohematology	Т	I	F	NA	NA	NA	Т	Т
MLS 3312 Clinical Immunology and Virology	Т	I	F	NA	NA	NA	Т	Т
MLS 3313 Advanced Hematology and Hemostasis	T	I	F	NA	NA	NA	Т	Т
MLS 3314 Advanced Clinical Chemistry	Т	I	F	NA	NA	NA	Т	Т
MLS 3316 Advanced Clinical Microbiology and Molecular Diagnostics	T	I	F	NA	NA	NA	Т	Т
MLS 4409 Clinical Correlation	I	I	I	NA	NA	NA	Т	Т
MLS 4410 Interdisciplinary Healthcare Teams	Т	Т	Т	Т	NA	NA	Т	Т
MLS 4411 MLS Simulated Laboratory I	Т	Т	I	NA	NA	NA	Т	Т
MLS 4412 MLS Simulated Laboratory II	I	I	F	NA	NA	NA	Т	I
MLS 4415 Laboratory Teaching and Supervision	I	I	F	NA	F	NA	Т	I
MLs 4453 Supervised Clinical Experience I	Т	Т	Т	I	F	NA	Т	I
MLs 4454 Supervised Clinical Experience II	Т	Т	Т	I	F	NA	Т	I
MLS 4803 Research Projects in MLS I	Т	Т	I	NA	I	F	I	F
MLS 4804 Research Projects in MLS II	Т	Т	I	NA	I	F	I	F

HIEE

- 1:Performance expectations set at appropriately high levels
- 2:Personal Investment

- 3:Meaningful Interactions
- 4:Diverse & Inclusive Experiences
- 5:Quality Feedback
- 6:Structured Opportunities to Reflect and Integrate Learning
- 7:Practical Application
- 8:Demonstration of Competence

Levels of Impact F=Foundation I=Integration T=Transformation NA=Not Applicable

HIEEs include capstone courses or experiences, community-engaged learning, evidence-based teaching practices, internships, project-based learning, study abroad/away, supplemental instruction, team-based learning, undergraduate research, pre-professional/career development experiences.

Additional information (HIEE planning, assessment, or other information):

The AAS/MLT and BS/MLS programs in Medical Laboratory Sciences are focused discipline specific courses that are purposefully built to educate and train individuals that are prepared to work in a professional field. Our disciplines are dependent on students performing their tasks with the highest degree of precision and accuracy. As such, we have integrated into almost all of the MLS courses, clear definitions of performance (HIEE 1), the importance of their profession and work (HIEE 2), collaboration with other health care workers on a constant basis (HIEE 3), the practical applications of all the theory based material and its connection to their work in the lab (HIEE 7), and a constant assessment and demonstration of competence across all fields with various forms of skills assessments (HIEE 8). This is why we might not have specific 'experiences' dedicated to these HIEE categories, but instead integrate a few key ones throughout the curriculum. The courses that might come closest to be committed exclusively to HIEE are the Supervised Clinical Experience courses, Research Projects in MLS, and Interdisciplinary Healthcare Teams.

E. Assessment Plan

Please update the Assessment Plan for your department displayed on the assessment site: http://www.weber.edu/portfolio/departments.html. Keep in mind that reporting will be done biennially instead of annually; that should be reflected in your assessment plan. Please ensure that Gen Ed courses are assessed/reported at least twice during a standard program review cycle.

A complete plan will include a list of courses from which data will be gathered and the schedule, as well as an overview of the assessment strategy the department is using (for example, portfolios, or a combination of Chi assessment data and student survey information, or industry certification exams, etc.), and plans for continuous improvement.

Assessment plan:

1100 COCINICITO PICTIO		
Outcome	Courses that address the outcome	Assessment
Knowledge Goal: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	All courses except MLS 1001, 3301	А, В, С
2. Knowledge Goal: Apply mathematical calculations to laboratory situations.	All courses except MLS 1001, 3301, 4409, and 4415	А, В, С
3. Laboratory Skill: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	All courses except MLS 1001, 3301, 4409, and 4415	А, В, С
4. Laboratory Skill: Correlate laboratory theory and terminology to practical laboratory work.	All courses except MLS 1001, 3301	A, B, C
5. Laboratory Skill: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	All courses except MLS 1001, 3301, and 4415	A, B, C
6. Diagnostic Skill: Relate laboratory findings to common disease processes.	All courses except MLS 1001, 3301, 3302, 4415, and	А, С
7. Professionalism and Ethics: Demonstrate professional conduct and ethical behavior.	All MLS courses	А, В
8. Communication Skill: Demonstrate effective communication skills and behaviors with colleagues in the program and in a laboratory setting.	All MLS courses	В

A: ChiTester assessment data

B: Laboratory exercises and evaluations

C: National Certification Exam (ASCP MLT and MLS)

F. Report of assessment results for the most previous academic year:

There are varieties of ways in which departments can choose to show evidence of learning. This is one example. The critical pieces to include are 1) learning outcome being assessed, 2) method(s) of measurement used, 3) threshold for 'acceptable – that is, the target performance, 4) actual results of the assessment, 5) interpretation/reflection on findings 6) the course of action to be taken based upon the interpretation, and 7) how that action will be evaluated.

A. Evidence of Learning: Courses within the Major

Evidence of Learning: MLS 1010 Core Laboratory Skills

	Evidence o	of Learning: Courses v	vithin the Major: MLS	5 1010	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 1:	Measure 1: 6 Unit	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Demonstrate knowledge	exams and one	Students are	The majority of	Only the students	No changes needed
of theory underlying	comprehensive	expected to score	students were able	who achieve	at this time
laboratory testing using	final where	80% or better to	to achieve 80% or	competency are	
analytical, interpretive,	students are	prove knowledge	higher competency	eligible to be	
and problem solving	assessed through	and competency		admitted to the	
skills.	multiple choice			MLS program.	
	questions and case				
	study scenarios				
	Measure 2	Measure 1:	Measure 1:	Measure 1:	Measure 1:
	12 laboratory	Students are	The majority of	Only the students	No changes needed
	sessions that focus	expected to score	students were able	who achieve	at this time
	on concept	80% or better to	to achieve 80% or	competency are	
	application and	prove knowledge	higher competency	eligible to be	
	practical work	and competency		admitted to the	
				MLS program.	

	Evidence o	of Learning: Courses v	vithin the Major: MLS	S 1010	
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Measures*				
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Multiple choice questions in Exam 4 assess absolute and raw sperm counts	Measure 1: Students will score 80% or better on 50 questions.	Measure 1: The majority of students scored 80% or better on Exam 4.	Measure 1: Most students successfully applied mathematical calculations to laboratory situations.	Measure 1: No changes needed at this time
	Measure 2: Formative assessment in the form of a group quiz during lecture following the sperm count lecture assesses calculating absolute and raw sperm counts.	Measure 2: Students will correctly perform mathematical calculations in class and answer questions as a group and be able to apply to laboratory situations.	Measure 2: The majority of the students correctly performed mathematical calculations in class.	Measure 2: Students understand the concept and are able to apply it in laboratory situations.	Measure 2: No changes needed at this time
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis,	Measure 1: Unit 4 Exam tests knowledge theory of Phlebotomy	Measure 1: The majority of the students will score 80% or better on 50 questions	Measure 1: The majority of students scored 80% or better on Exam 4.	Measure 1: Students successfully demonstrated their understanding of phlebotomy theory.	Measure 1: No changes needed at this time
interpretation, and use of quality assurance procedures.	Measure 2: Demonstrate knowledge of phlebotomy by successfully performing a syringe and a	Measure 2: Students will correctly perform phlebotomy on a classmate.	Measure 2: The majority of students were able to successfully perform phlebotomy.	Measure 2: Most students were able to apply the theory learned and successfully draw blood.	Measure 2: No changes needed at this time

	Evidence of Learning: Courses within the Major: MLS 1010						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of	Learning	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
	vacutainer draw on						
	a classmate.						
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:		
Correlate laboratory	Exam 3 uses 50	Students will score	The majority of	Most students	No changes needed		
theory and terminology	multiple choice	80% or better on	students scored	successfully	at this time		
to practical laboratory	questions to assess	50 questions.	80% or better on	correlated			
work	theory on reagent		50 questions	laboratory theory			
	test strips and			of reagent test			
	correlate it with			strips to			
	urine microscopic			microscopic			
	analysis.			urinalysis			
				performed as			
				practical work.			
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2: No		
	Five laboratory	Students must	The majority of	The majority of	clinical changes		
	sessions requiring	score 80% or better	students scored	students performed	needed at this time		
	students to perform	on laboratory	80% or better on	the required skills			
	urine microscopic	assignments.	urine microscopic	during their			
	examination and		and reagent test	laboratory			
	reagent test strips.		strips laboratory	assignments			
			assignments.	demonstrating			
				proficiency in			
				urinalysis.			

	Evidence of	of Learning: Courses v	vithin the Major: MLS	5 1010	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*) t) / · · · · · ·) / I
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Gather additional	A set of Urinalysis Case Studies from	Students will score 80% or better on 6	The majority of students scored	The majority of students	No changes needed at this time
laboratory data and apply problem solving	Unit 2.	case studies.	80% or better on 6	successfully	at this time
skills to solve	Omit 2.	case studies.	case studies.	demonstrated	
problems/discrepancies.			cuse studies.	theory underlying	
Factorian and a specific section				urinalysis and how	
				it relates to renal	
				disease.	
Learning Outcome 6:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Relate laboratory	A set of Urinalysis	Students will score	The majority of	The majority of	No changes needed
findings to common	Case Studies from	80% or better on 6	students scored	students	at this time
disease.	Unit 2.	case studies.	80% or better on 6	successfully	
			case studies.	demonstrated	
				theory underlying	
				urinalysis and how it relates to renal	
				disease.	
	Measure 2:	Measure 2:	Measure 2: The	Measure 2: The	Measure 2:
	50 questions on	Students will score	majority of	majority of	No changes
	Exam 3 dealing	80% or better on	students were able	students correctly	needed at this time.
	with renal disease.	the Unit 2 exam.	to score 80% or	related laboratory	
			better.	findings to	
				common renal	
				diseases.	3.5
Learning Outcome 7:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Demonstrate	Attendance and	Students will	The majority of	The majority of	No changes needed
professional conduct and ethical behavior	punctuality	attend laboratory section and be	students attended	students attended	at this time.
and cuncal ochavior	expectations defined in course	punctual.	laboratory sessions unless previously	laboratory sessions and most were	
	syllabus.	panetual.	excused.	punctual.	
	by Hadab.		one about	Parietaar.	1

	Evidence of Learning: Courses within the Major: MLS 1010						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of	Learning	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:		
	Adherence to	Students will	All students	Most students	For campus		
	laboratory dress	comply with dress	complied with	were in compliance	students, addition		
	code and safety	code and safety	dress code and	with dress code and	of a self-		
	procedures through	procedures.	safety procedures.	safety procedures.	assessment tool for		
	viewing safety			OSHA compliant	OSHA		
	videos and			dress was a	compliance, worth		
	discussions during			problem at times.	points OR require		
	the first lab session.				all students wear		
I a militario Orata a mara Or	Measure 1:	Measure 1:	Measure 1:	Measure 1:	scrubs to lab. Measure 1:		
Learning Outcome 8: Demonstrate effective	Class discussions	Students will	Students are able to	All students were			
communication skills	and open-ended	participate in class	communicate their	able to	No changes needed at this time.		
and behaviors with	questions	discussions when	knowledge through	communicate their	needed at this time.		
colleagues in the	questions	open ended	class discussion	knowledge through			
program and in the		questions are asked	Class discussion	class discussions.			
laboratory		regarding the		Class discussions.			
		material.					
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2: No		
	Reflective	Students will be	Students will	Students reflected	clinical changes		
	questions as part of	able to respond to	evaluate	on their skills and	needed at this time.		
	phlebotomy lab	2 reflective	themselves and	self-evaluated			
	competency.	questions and	offer suggestions	allowing them to			
		evaluate their own	on how they can	find ways to			
		performance.	improve their	improve.			
			phlebotomy skills.				

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

** MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 1010: Core Laboratory Skills

This course encompasses principles and applications to laboratory testing including safe practices for the laboratory practitioner, specimen quality assurance, phlebotomy, urinalysis, basic concepts in clinical immunology, and clinical approaches to immunological testing. Laboratory session addresses the principles and applications to laboratory testing including safe practices for the laboratory practitioner, specimen quality assurance, phlebotomy, urinalysis, basic concepts in clinical immunology, and clinical approaches to immunological testing. This course along with 6 months of clinical experience qualifies students to sit for the MLA (ASCP) exam under route 6. Data based on instruction from 2014-present by Janice Thomas.

Evidence of Learning: Courses within the Major: MLS 1113

Lyidence of Learning. Co.			vithin the Major: MLS	1113	
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: 6 Unit exams and one comprehensive final where students are assessed through multiple choice questions and case study scenarios	Measure 1: Students are expected to score 80% or better to prove knowledge and competency	Measure 1: The majority of students were able to achieve 80% or higher competency	Measure 1: Only the students who achieve competency are eligible to be admitted to the MLS program.	Measure 1: No changes needed at this time
	Measure 2 12 laboratory sessions that focus on concept application and practical work	Measure 1: Students are expected to score 80% or better to prove knowledge and competency	Measure 1: The majority of students were able to achieve 80% or higher competency	Measure 1: Only the students who achieve competency are eligible to be admitted to the MLS program.	Measure 1: No changes needed at this time
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Multiple choice questions in Exam 4 assess absolute and raw sperm counts	Measure 1: Students will score 80% or better on 50 questions.	Measure 1: The majority of students scored 80% or better on Exam 4.	Measure 1: Most students successfully applied mathematical calculations to laboratory situations.	Measure 1: No changes needed at this time
	Measure 2: Formative assessment in the form of a group	Measure 2: Students will correctly perform mathematical	Measure 2: The majority of the students correctly performed	Measure 2: Students understand the concept and are	Measure 2: No changes needed at this time

	Evidence o	of Learning: Courses w	vithin the Major: MLS	3 1113	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
	Direct and Indirect				
	Measures*				
	quiz during lecture	calculations in	mathematical	able to apply it in	
	following the	class and answer	calculations in	laboratory	
	sperm count lecture	questions as a	class.	situations.	
	assesses calculating	group and be able			
	absolute and raw	to apply to			
	sperm counts.	laboratory			
		situations.			
8	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Perform laboratory	Unit 4 Exam tests	The majority of the	The majority of	Students	No changes needed
1 - 1	knowledge theory	students will score	students scored	successfully	at this time
	of Phlebotomy	80% or better on	80% or better on	demonstrated their	
specimen collection and		50 questions	Exam 4.	understanding of	
processing, analysis,	N/ 0	N/ 2	N/ 2	phlebotomy theory.	N/ 2
1 /	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:
1 2	Demonstrate	Students will	The majority of	Most students	No changes
1 -	knowledge of	correctly perform	students were able	were able to apply	needed at this time
	phlebotomy by	phlebotomy on a	to successfully	the theory learned	
	successfully	classmate.	perform	and successfully draw blood.	
	performing a syringe and a		phlebotomy.	draw blood.	
	vacutainer draw on				
	a classmate.				
	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
8	Exam 3 uses 50	Students will score	The majority of	Most students	No changes needed
1	multiple choice	80% or better on	students scored	successfully	at this time
	questions to assess	50 questions.	80% or better on	correlated	at tills tillle
	theory on reagent	20 questions.	50 questions	laboratory theory	
	test strips and		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	of reagent test	
	correlate it with			strips to	

	Evidence o	of Learning: Courses w	vithin the Major: MLS	3 1113	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	urine microscopic			microscopic	
	analysis.			urinalysis	
				performed as	
) / O) / O) / O	practical work.	M 2 M
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2: No
	Five laboratory	Students must score 80% or better	The majority of students scored	The majority of	clinical changes needed at this time
	sessions requiring students to perform	on laboratory	80% or better on	students performed the required skills	needed at this time
	urine microscopic	assignments.	urine microscopic	during their	
	examination and	assignments.	and reagent test	laboratory	
	reagent test strips.		strips laboratory	assignments	
	reagent test surps.		assignments.	demonstrating	
			designification.	proficiency in	
				urinalysis.	
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Gather additional	A set of Urinalysis	Students will score	The majority of	The majority of	No changes needed
laboratory data and	Case Studies from	80% or better on 6	students scored	students	at this time
apply problem solving	Unit 2.	case studies.	80% or better on 6	successfully	
skills to solve			case studies.	demonstrated	
problems/discrepancies.				theory underlying	
				urinalysis and how	
				it relates to renal	
				disease.	
Learning Outcome 6:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Relate laboratory	A set of Urinalysis	Students will score	The majority of	The majority of	No changes needed
findings to common	Case Studies from	80% or better on 6	students scored	students	at this time
disease.	Unit 2.	case studies.	80% or better on 6	successfully	
			case studies.	demonstrated	
				theory underlying	

	Evidence o	of Learning: Courses v	vithin the Major: MLS	1113	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
				urinalysis and how	
				it relates to renal	
				disease.	
	Measure 2:	Measure 2:	Measure 2: The	Measure 2: The	Measure 2:
	50 questions on	Students will score	majority of	majority of	No changes
	Exam 3 dealing	80% or better on	students were able	students correctly	needed at this time.
	with renal disease.	the Unit 2 exam.	to score 80% or	related laboratory	
			better.	findings to	
				common renal diseases.	
Lagraina Outagna 7.	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Learning Outcome 7: Demonstrate	Attendance and	Students will	The majority of	The majority of	No changes needed
professional conduct	punctuality	attend laboratory	students attended	students attended	at this time.
and ethical behavior	expectations	section and be	laboratory sessions	laboratory sessions	at this time.
and emical behavior	defined in course	punctual.	unless previously	and most were	
	syllabus.	panetaan.	excused.	punctual.	
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:
	Adherence to	Students will	All students	Most students	For campus
	laboratory dress	comply with dress	complied with	were in compliance	students, addition
	code and safety	code and safety	dress code and	with dress code and	of a self-
	procedures through	procedures.	safety procedures.	safety procedures.	assessment tool for
	viewing safety			OSHA compliant	OSHA
	videos and			dress was a	compliance, worth
	discussions during			problem at times.	points OR require
	the first lab session.				all students wear
<u> </u>	1.6	3.5	3.6		scrubs to lab.
Learning Outcome 8:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Demonstrate effective		Students will	Students are able to	All students were	No changes
communication skills		participate in class	communicate their	able to	needed at this time.

	Evidence o	of Learning: Courses w	vithin the Major: MLS	1113	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
and behaviors with	Class discussions	discussions when	knowledge through	communicate their	
colleagues in the	and open-ended	open ended	class discussion	knowledge through	
program and in the	questions	questions are asked		class discussions.	
laboratory		regarding the			
		material.			
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2: No
	Reflective	Students will be	Students will	Students reflected	clinical changes
	questions as part of	able to respond to	evaluate	on their skills and	needed at this time.
	phlebotomy lab	2 reflective	themselves and	self-evaluated	
	competency.	questions and	offer suggestions	allowing them to	
		evaluate their own	on how they can	find ways to	
		performance.	improve their	improve.	
			phlebotomy skills.		

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 1113: Introduction to laboratory practices.

This course encompasses principles and applications to laboratory testing including safe practices for the laboratory practitioner, specimen quality assurance, phlebotomy, urinalysis, basic concepts in clinical immunology, and clinical approaches to immunological testing. Laboratory session addresses the principles and applications to laboratory testing including safe practices for the laboratory practitioner, specimen quality assurance, phlebotomy, urinalysis, basic concepts in clinical immunology, and clinical approaches to immunological testing. Data based on instruction from 2014-present by Janice Thomas.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 1114 Principles of Hematology and Hemostasis

	Evidence of Learning: MLS 1114						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**		
		Learning					
Students will	Direct and Indirect						
*	Measures*	1 000/	1.070/.0	3.5 4.050/.0) / / / / / / / / / / / / / / / / / / /		
Learning Outcome 1:	Measure 1: The	Measure 1: > 90%	Measure 1: 95% of	Measure 1: 95% of	Measure 1: No		
Demonstrate	Unit 1 exam tests	of students must	students scored	students	curricular or		
knowledge of theory	the principles of	score 80% or better	80% or better on	successfully	pedagogical		
underlying laboratory	hematology testing.	on exams, proving	both exams.	demonstrated	changes needed at		
testing using analytical,	The Unit 5 exam	do not score above		theory underlying	this time		
interpretive, and problem-solving skills.	tests the principles of hemostasis	80%, they are		laboratory testing			
problem-sorving skins.	testing. 50 multiple	required to score					
	choice questions	well on a retake					
	each.	exam to prove					
		competency.					
	Measure 2: 11	Measure 2: >90%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	graded laboratory	of Students are	of students were	students correctly	clinical changes		
	practice sessions	required to score	able to correctly	performed required	needed at this time		
	and 2	above an 80% in	perform required	laboratory skills			
	comprehensive lab	laboratory skills	laboratory skills				
	practical's.	and competencies.					
_	1						
	1 -						
	1 1						
laboratory situations.		on these questions.	questions.				
					this time		
	exam 1, 2 and 5						
	Maggira 2:	Maggira 2: \0.00%	Maggira 2: 100%		Maggira 2: No		
	•						
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Many multiple-choice questions requiring mathematical calculations in exam 1, 2 and 5 Measure 2: Laboratory sessions requiring	Measure 1: >90% of students will score 80% or better on these questions. Measure 2: >90% of students will correctly perform	Measure 1: 95% of students scored 80% or better on 8 questions. Measure 2: 100% of students correctly performed	Measure 1: 95% of students successfully applied mathematical calculations to laboratory situations. Measure 2: 100% of students correctly performed	Measure 1: No curricular or pedagogical changes needed at this time Measure 2: No clinical changes needed at this time		

	Evidence of Learning: MLS 1114						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**		
Students will	Direct and Indirect Measures*						
Learning Outcome 3:	applications of laboratory mathematical calculations Measure 1: 50	mathematical calculations in laboratory situations. Measure 1: >90%	mathematical calculations in laboratory situations. Measure 1: 95% of	mathematical calculations in laboratory situations. Measure 1: 95% of	Measure 1: No		
Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	multiple choice questions from Exam 1 and 10 multiple choice questions from Exam 5	of students will score >80% on 60 questions	students scored 80% or better on 20 questions.	students successfully demonstrated knowledge of evaluating specimen acceptability and optimal analysis methods.	curricular or pedagogical changes needed at this time		
	Measure 2: Demonstrate proper knowledge of specimen criteria in a hematology laboratory setting	Measure 2: >90% of students will correctly determine proper sample suitability.	Measure 2: >95% of students were able to correctly determine proper sample suitability for hematology analysis	Measure 2: All students correctly determined proper sample suitability.	Measure 2: No clinical changes needed at this time		
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: 50 multiple choice questions each from exams 2, 3, and 4	Measure 1: >90% of students will score 80% or better on all questions.	Measure 1: >95% of students scored 80% or better on 20 questions	Measure 1: >95% of students successfully correlated laboratory theory and terminology to practical laboratory work.	Measure 1: No curricular or pedagogical changes needed at this time		

	Evidence of Learning: MLS 1114						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**		
Students will	Direct and Indirect Measures*	-					
	Measure 2: Evaluate abnormal hematology smears from a wide variety of disorders during 6 laboratory sessions. Assess competency during 1 laboratory practical exam	Measure 2: >90% of students will score 80% or better on the laboratory practical exam and participate in all required laboratory sessions.	Measure 2: >95% of students scored 80% or better on the laboratory practical exam and participated in all required laboratory sessions.	Measure 2: >95% of students performed the required skills during the laboratory practical exam and required laboratory sessions.	Measure 2: No clinical changes needed at this time		
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: A set of 15 multiple choice questions from Exams 1 and 5	Measure 1: >90% of students will score 80% or better on 20 questions.	Measure 1: >95% of students scored 80% or better on 20 questions.	Measure 1: >95% of students successfully demonstrated problem solving skills	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Students correlate patient history and diagnoses to laboratory findings in 6 laboratory sessions	Measure 2: >90% of students will correctly correlate patient history and diagnoses to laboratory findings in 6 laboratory sessions	Measure 2: >95% of students were able to correctly correlate patient history and diagnoses to laboratory findings in 6 laboratory sessions	Measure 2: >95% of students correctly correlated patient history and diagnoses to laboratory findings in 6 laboratory sessions	Measure 2: No clinical changes needed at this time		
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: 50 multiple choice questions each from exams 2, 3, and 4,	Measure 1: >90% of students will score 80% or better on 50 multiple	Measure 1: >95% of students scored 80% or better on 50 multiple choice	Measure 1: >95% of students correctly related laboratory findings	Measure 1: No curricular or pedagogical		

		Evidence of Learn	ing: MLS 1114		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*	-			
	and 25 questions from exam 5.	choice questions each from exams 2, 3, and 4, and 25 questions from exam 5.	questions each from exams 2, 3, and 4, and 25 questions from exam 5.	to common diseases.	changes needed at this time
	Measure 2: In 6 laboratory sessions students relate laboratory findings to common diseases	Measure 2: >90% of students will perform the required skills in the laboratory	Measure 2: 100% of students were able to relate laboratory findings to common diseases.	Measure 2: >95% of students correctly related laboratory findings to common diseases.	Measure 2: No clinical changes needed at this time
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: >95% of students will attend laboratory section and be punctual.	Measure 1: 100% attendance in laboratory section. >95% punctuality	Measure 1: >95% of students attended laboratory section and most were punctual	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: Adherence to laboratory dress code and safety procedures	Measure 2: >95% of students will comply with dress code and safety procedures.	Measure 2: 100% of students complied with dress code and safety procedures	Measure 2: >95% of students were in compliance with dress code and safety procedures.	Measure 2: No clinical changes needed at this time
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the	Measure 1: Laboratory etiquette and expectations are defined in the syllabus. Measured	Measure 1: >95% of students will be punctual to laboratory sessions, and remain task-	Measure 1: >95% of students were punctual to laboratory sessions, and remained task-	Measure 1: >95% of students demonstrated effective communication	Measure 1: No curricular or pedagogical changes needed at this time
program and in the laboratory	by punctuality and participation.	oriented throughout the session in order	oriented throughout the session and	skills through punctuality and	

Evidence of Learning: MLS 1114									
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of				
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**				
		Learning							
Students will	Direct and Indirect								
	Measures*								
		to receive full	received full	tasks during					
		participation credit.	participation credit.	laboratory sessions.					

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 1114 is an introductory hematology course covering:

- The theory and principles of hematology and hemostasis relevant to routine laboratory testing
- Normal erythrocyte physiology and associated disorders
- Normal leukocyte physiology and associated non-malignant and malignant blood disorders
- Normal platelet and coagulation physiology and associated disorders.

MLS 1114 contains all eight of the program's identified learning goals in varying amounts. As noted in the curriculum map, learning goals 5 and 8 are areas of introduction, learning goals 1 and 3 are emphasized, and learning goals 2, 4, 6, and 7 are utilized.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 2212 Principles of Clinical Microbiology I

	Evidence of Learning: MLS 2212							
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**			
Students will	Direct and Indirect Measures*							
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: 3 quizzes (100% of questions), 4 exams and comprehensive final (75% of questions) Measure 2: 13 weeks of graded	Measure 1: 100% of students will score 80% or better on all test questions (quizzes are excluded) Measure 2: 100% of students will	Measure 1: Approx. 86% of students scored 80% or better on all exams (avg. 25 of 29 students) Measure 2: 100% of students were	Measure 1: 86% of students successfully demonstrated theory underlying laboratory testing Measure 2: All students correctly	Measure 1: No curricular or pedagogical changes needed at this time Measure 2: No clinical changes			
	laboratory activities and 2 practical in- lab exams	score 80% or better by correctly performing required laboratory skills	able to correctly perform required laboratory skills	performed required laboratory skills	needed at this time			
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: 1-2 questions on quiz 2 and exam 2, fill-in- the blank and multiple choice	Measure 1: 100% of students will score 80% or better on math questions	Measure 1: 100% of students scored 80% or better on math questions	Measure 1: All students successfully applied mathematical calculations to laboratory situations	Measure 1: No curricular or pedagogical changes needed at this time			
	Measure 2: 6 weekly laboratory activities with 1-2 unknown patient specimens per week which utilize correct reporting of urine cultures	Measure 2: 100% of students will score 80% or better on mathematical calculations in laboratory situations	Measure 2: 100% of students correctly performed mathematical calculations 80% or better in laboratory situations	Measure 2: All students correctly performed mathematical calculations in lab situations 80% of the time or better	Measure 2: No clinical changes needed at this time			

Evidence of Learning: MLS 2212						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of	
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**	
Students will	Direct and Indirect Measures*					
	involving mathematical calculations					
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 1: 13 weeks of graded laboratory activities, each involving identification of bacterial unknown specimens and 2 practical in-lab	Measure 1: 100% of students will score 80% or better on laboratory activities and practical exams	Measure 1: 100% of students scored 80% or better overall on final course laboratory grade	Measure 1: All students successfully demonstrated knowledge of evaluating specimen acceptability and optimal analysis	Measure 1: No curricular or pedagogical changes needed at this time	
	exams Measure 2: Demonstrate proper knowledge of quality assurance procedures in clinical microbiology laboratory	Measure 2: 100% of students will correctly determine proper quality assurance procedures in clinical microbiology laboratory	Measure 2: 100% of students were able to correctly determine proper quality assurance procedures in clinical microbiology laboratory	methods. Measure 2: All students correctly determined quality assurance procedures in clinical microbiology laboratory	Measure 2: No clinical changes needed at this time	
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: All course exams and 3 quizzes have 50% of questions that correlate theory/terminology to laboratory testing	Measure 1: 100% of students will score 80% or better	Measure 1: 86% of students scored 80% or better	Measure 1: 86% of students successfully correlated laboratory theory and terminology to	Measure 1: No curricular or pedagogical changes needed at this time	

		Evidence of Learn	ing: MLS 2212		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
				practical laboratory work.	
	Measure 2: Assess 4-5 weekly laboratory unknowns in each of the 13 laboratory activities and 1 comprehensive lab final	Measure 2: 100% of students will score 80% or better overall on course laboratory activities and comprehensive lab final	Measure 2: 100% of students scored 80% or better overall on course laboratory activities and comprehensive lab final	Measure 2: All students performed the required skills during 13 lab activities and comprehensive lab final	Measure 2: No clinical changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: Four case study homework assignments in Unit 2 and Unit 3.	Measure 1: 100% of students must complete assignments	Measure 1: 100% of students completed the four assignments.	Measure 1: All students successfully demonstrated problem solving skills	Measure 1: No curricular or pedagogical changes needed at this time
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Exams 2,3,4 and the final exam contain approximately 10% diagnostic questions	Measure 1: 100% of students will score 80% or better on the diagnostic questions	Measure 1: 100% of students scored 80% or better on the diagnostic questions	Measure 1: All students correctly related laboratory findings to common diseases.	Measure 1: No curricular or pedagogical changes needed at this time

		Evidence of Learn	ing: MLS 2212		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
		Learning			
Students will	Direct and Indirect				
	Measures*				
	Measure 2: In 11 of	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	the weekly	of students will	of students were	students correctly	clinical changes
	laboratory activities	perform 80% or	able to relate	related laboratory	needed at this time
	specimen source of	better relating	laboratory findings	findings to common	
	unknowns is related	specimen	to common diseases	diseases.	
	to diseases	unknowns to related	80% of the time		
		diseases			
Learning Outcome 7:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate	Attendance and	of students will	attendance in	students attended	curricular or
professional conduct	punctuality	attend laboratory	laboratory section.	laboratory section	pedagogical
and ethical behavior	expectations	section and be	95% punctuality	and most were	changes needed at
	defined in course	punctual.		punctual	this time
	syllabus				
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	Adherence to	of students will	of students	students were in	clinical changes
	laboratory dress	comply with dress	complied with dress	compliance with	needed at this time
	code and safety	code and safety	code and safety	dress code and	
	procedures	procedures.	procedures	safety procedures.	
Learning Outcome 8:	Measure 1: Correct	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	reporting	of students will	of students were	students were able	curricular or
communication skills	(communication) of	correctly report	able to correctly	to correctly report	pedagogical
and behaviors with	laboratory results in	results 80% or	report results 80%	laboratory reports.	changes needed at
colleagues in the	13 weekly	better on laboratory	or better on		this time
program and in the	activities.	reports.	laboratory reports.		
laboratory	Measure 2:	Measure 2: 100 %	Measure 2: 100%	Measure 2: All	Measure 2: No
	Students work in	of students will	of students	students	curricular or
	teams for 6 of 13	demonstrate	demonstrated	demonstrated	pedagogical
	weekly laboratory	effective team work	effective team	effective team	changes needed at
	activities	during the 6 weeks	work.	work.	this time

Evidence of Learning: MLS 2212									
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of				
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**				
		Learning							
Students will	Direct and Indirect								
	Measures*								
		of laboratory							
		activities							

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 2212 – Principles in Clinical Microbiology I is an introductory clinical microbiology course provides an in-depth coverage of clinically significant bacteria including epidemiology, pathogenicity, and procedures for traditional laboratory identification. Major organisms include Gram positive cocci, enteric Gram negative rods, non-fermentative Gram negative rods, and miscellaneous Gram negative rods. This course contains all eight of the program's identified learning goals. In all cases, the measures show that 100% of the students are reaching all 8 goals at levels of 80% or above, so no curricular or clinical changes are seen as needed at this time. Data in this table are derived from two years and three sections of the course taught from Fall 2016-2018 by Kendal Beazer, with student results derived from the most recent cohort.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 2214 Principles of Clinical Microbiology II

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
		Learning			
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 1:	Measure 1: 2	Measure 1: 100%	Measure 1: Approx.	Measure 1: 86% of	Measure 1: No
Demonstrate	quizzes (100% of	of students will	86% of students	students	curricular or
knowledge of theory	questions), 3 exams	score 80% or better	scored 80% or	successfully	pedagogical
underlying laboratory	and a	on all test questions	better all exams	demonstrated	changes needed at
testing using analytical,	comprehensive final	(quizzes are	(avg. 24 of 28	theory underlying	this time
interpretive, and	(75% of questions)	excluded)	students)	laboratory testing	
problem solving skills.	Measure 2: 11	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	weeks of graded	of students will	of students were	students correctly	clinical changes
	laboratory activities	score 80% or better	able to correctly	performed required	needed at this time
	and 1 practical in-	by correctly	perform required	laboratory skills	
	lab exam	performing required	laboratory skills		
	37 1 1 2	laboratory skills	1 1000/	3.6 1 11)
Learning Outcome 2:	Measure 1: 1-2	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Apply mathematical calculations to	questions on exam	of students will	of students scored	students	curricular or
	1 multiple choice	score 80% or better	80% or better on	successfully applied	pedagogical
laboratory situations.		on math questions	math questions	mathematical calculations to	changes needed at this time
					this time
				laboratory situations	
	Measure 2: 3	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	weekly laboratory	of students will	of students	students correctly	clinical changes
	activities with 1-2	score 80% or better	correctly performed	performed	needed at this time
	unknown patient	on mathematical	mathematical	mathematical	needed at this time
	specimens and 1	calculations in	calculations 80% or	calculations in lab	
	week of hospital	laboratory	better in laboratory	situations 80% of	
	urine culture plates,	situations	situations	the time or better	
	which utilize	Situations	Situations	the time of better	
	Willon dellize		l		

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect				
	Measures*				
	correct reporting of				
	urine cultures				
	involving				
	mathematical calculations.				
Learning Outcome 3:	Measure 1: 11	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Perform laboratory	weeks of graded	of students will	of students scored	students	curricular or
procedures from simple	laboratory activities	score 80% or better	80% or better	successfully	pedagogical
to complex, including	involving	on laboratory	overall on final	demonstrated	changes needed at
specimen collection	identification of	activities and	course laboratory	knowledge of	this time
and processing,	bacteria, parasites,	practical exams	grade	evaluating	
analysis, interpretation,	and fungi			specimen	
and use of quality				acceptability and	
assurance procedures.				optimal analysis	
	N/ 2	M 2 1000/	Measure 2: 100%	methods.	M 2 N
	Measure 2:	Measure 2: 100% of students will	of students were	Measure 2: All	Measure 2: No clinical changes
	Demonstrate proper knowledge of	correctly determine	able to correctly	students correctly determined quality	needed at this time
	quality assurance	proper quality	determine proper	assurance	needed at this time
	procedures in	assurance	quality assurance	procedures in	
	clinical	procedures in	procedures in	clinical	
	microbiology	clinical	clinical	microbiology	
	laboratory	microbiology	microbiology	laboratory	
		laboratory	laboratory		
Learning Outcome 4:	Measure 1: All	Measure 1: 100%	Measure 1: 86% of	Measure 1: 86% of	Measure 1: No
Correlate laboratory	course exams and 2	of students will	students scored	students	curricular or
theory and terminology	quizzes have 50%	score 80% or better	80% or better on	successfully	pedagogical
to practical laboratory	of questions that correlate	on questions.	questions	correlated	changes needed at
work	correlate			laboratory theory	this time

Evidence of Learning: Courses within the Major					
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*	C			
	theory/terminology to laboratory testing			and terminology to practical laboratory work.	
	Measure 2: Assess 4-5 weekly laboratory unknowns in each of the 11 laboratory activities	Measure 2: 100% of students will score 80% or better overall on course laboratory activities	Measure 2: 100% of students scored 80% or better overall on course laboratory activities	Measure 2: All students performed the required skills during 11 lab activities	Measure 2: No clinical changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: Four case study homework assignments in Unit 4, 6, 8, and 11.	Measure 1: 100% of students must complete assignments	Measure 1: 100% of students completed the four assignments.	Measure 1: All students successfully demonstrated problem solving skills	Measure 1: No curricular or pedagogical changes needed at this time
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: All exams contain approximately 20% diagnostic questions	Measure 1: 100% of students will score 80% or better on the diagnostic questions	Measure 1: 95% of students scored 80% or better on the diagnostic questions	Measure 1: 95% of students correctly related laboratory findings to common diseases.	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: In 11 of the weekly laboratory activities, specimen	Measure 2: 100% of students will perform 80% or better relating	Measure 2: 100% of students were able to relate laboratory findings	Measure 2: All students correctly related laboratory	Measure 2: No clinical changes needed at this time

Evidence of Learning: Courses within the Major					
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*	Learning			
	source of unknowns is related to diseases	specimen unknowns to related diseases	to common diseases 80% of the time	findings to common diseases.	
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: 100% of students will attend laboratory section and be punctual.	Measure 1: 100% attendance in laboratory section. 95% punctuality	Measure 1: All students attended laboratory section and most were punctual	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: Adherence to laboratory dress code and safety procedures	Measure 2: 100% of students will comply with dress code and safety procedures.	Measure 2: 100% of students complied with dress code and safety procedures	Measure 2: All students were in compliance with dress code and safety procedures.	Measure 2: No clinical changes needed at this time
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the	Measure 1: Correct reporting (communication) of laboratory results in 11 weekly activities.	Measure 1: 100% of students will correctly report results 80% or better on laboratory reports.	Measure 1: 100% of students were able to correctly report results 80% or better on laboratory reports.	Measure 1: All students were able to correctly report laboratory reports.	Measure 1: No curricular or pedagogical changes needed at this time
laboratory	Measure 2: Students work in teams for 3 of 11 weekly laboratory activities	Measure 2: 100 % of students will demonstrate effective team work during the 3 weeks of laboratory activities	Measure 2: 100% of students demonstrated effective team work.	Measure 2: All students demonstrated effective team work.	Measure 2: No curricular or pedagogical changes needed at this time

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

** MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 2214 – Principles in Clinical Microbiology II is an introductory course and is a continuation of MLS 2212, including antimicrobials, Gram positive rods, mycobacteria, anaerobes, mycology, and parasitology. This course contains all eight of the program's identified learning goals. In all cases, the measures show that 100% of the students are reaching all 8 goals at levels of 80% or above, so no curricular or clinical changes are seen as needed at this time. Data in this table are derived from two years and three sections of the course taught from Spring 2017-2019 by Kendal Beazer, with student results derived from the most recent cohort.

Evidence of Learning: Courses within the Major: MLS 2210 Principles of Immunohematology

	Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**		
		Learning	_	_			
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 1:	Measure 1: A set of	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Demonstrate	10 multiple choice	of students will	of students scored	students	curricular or		
knowledge of theory	questions from	score 80% or better	80% or better on 10	successfully	pedagogical		
underlying laboratory	Exam 2	on 10 questions	questions)	demonstrated	changes needed at		
testing using analytical,				theory underlying	this time		
interpretive, and				laboratory testing			
problem solving skills.	Measure 2: 24	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	graded laboratory	of students will	of students were	students correctly	clinical changes		
	practice sessions	correctly perform	able to correctly	performed required	needed at this time		
	and 2 practical	required laboratory	perform required	laboratory skills			
	exams	skills	laboratory skills				
Learning Outcome 2:	Measure 1: A set of	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Apply mathematical	20 multiple choice	of students will	of students scored	students	curricular or		
calculations to	questions from	score 80% or better	80% or better on 20	successfully applied	pedagogical		
laboratory situations.	Exams 3 and Final	on 10 questions.	questions.	mathematical	changes needed at		
	Exam			calculations to	this time		
				laboratory			
				situations.			
	Measure 2: 2	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	graded laboratory	of students will	of students	students correctly	clinical changes		
	applications of	correctly perform	correctly performed	performed	needed at this time		
	laboratory	mathematical	mathematical	mathematical			
	mathematical	calculations in	calculations in	calculations in			
	calculations	laboratory	laboratory	laboratory			
		situations.	situations.	situations.			

	Evidence of Learning: Courses within the Major						
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 1: A set of 20 multiple choice questions from Exams 1 and 2	Measure 1: 100% of students will score 80% or better on 20 questions	Measure 1: 96% of students scored 80% or better on 20 questions.	Measure 1: All students successfully demonstrated knowledge of evaluating specimen acceptability and optimal analysis methods.	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Demonstrate proper knowledge of specimen criteria in a blood bank laboratory setting	Measure 2: 100% of students will correctly determine proper sample suitability.	Measure 2: 100% of students were able to correctly determine proper sample suitability for blood bank analysis	Measure 2: All students correctly determined proper sample suitability.	Measure 2: No clinical changes needed at this time		
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: A set of 20 multiple choice questions from Exams 2 and 3	Measure 1: 100% of students will score 80% or better on 20 questions.	Measure 1: 100% of students scored 80% or better on 20 questions	Measure 1: All students successfully correlated laboratory theory and terminology to practical laboratory work.	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Assess unknowns with accuracy during 2	Measure 2: 100% of students will score 80% or better	Measure 2: 99% of students scored 80% or better on 2	Measure 2: Most students performed the required skills during the 2	Measure 2: No clinical changes needed at this time		

	Evidence of Learning: Courses within the Major					
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**	
	laboratory practical exams	on 2 laboratory practical exams	laboratory practical exams.	laboratory practical exams.		
Learning Outcome 5: Gather additional laboratory data and apply problem-solving skills to solve problems/discrepancies.	Measure 1: A set of 20 multiple choice questions from Exams 2 and 3	Measure 1: 100% of students will score 80% or better on 20 questions.	Measure 1: 100% of students scored 80% or better on 20 questions.	Measure 1: All students successfully demonstrated problem solving skills	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: Students resolve discrepancies in the laboratory sessions and must correlate patient history to laboratory findings	Measure 2: 100% of students will correctly resolve discrepancies in the laboratory sessions and correlate patient history to laboratory findings	Measure 2: 100% of students were able to correctly resolve discrepancies in the laboratory sessions and correlate patient history to laboratory findings	Measure 2: All students correctly resolved discrepancies in the laboratory sessions and correlated patient history to laboratory findings	Measure 2: No clinical changes needed at this time	
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: A set of 25 questions from Exams 2, 3, and 4	Measure 1: 100% of students will score 80% or better on 25 questions.	Measure 1: 100% of students scored 80% or better on 25 questions	Measure 1: All students correctly related laboratory findings to common diseases.	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: In 2 laboratory sessions students relate laboratory findings to common diseases	Measure 2: 100% of students will perform the required skills in the laboratory	Measure 2: 100% of students were able to relate laboratory findings to common diseases.	Measure 2: All students correctly related laboratory findings to common diseases.	Measure 2: No clinical changes needed at this time	

	Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**		
		Learning					
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 7:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Demonstrate	Attendance and	of students will	attendance in	students attended	curricular or		
professional conduct	punctuality	attend laboratory	laboratory section.	laboratory section	pedagogical		
and ethical behavior	expectations	section and be	89% punctuality	and most were	changes needed at		
	defined in course	punctual.		punctual	this time		
	syllabus						
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	Adherence to	of students will	of students	students were in	clinical changes		
	laboratory dress	comply with dress	complied with dress	compliance with	needed at this time		
	code and safety	code and safety	code and safety	dress code and			
	procedures	procedures.	procedures	safety procedures.			
Learning Outcome 8:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Demonstrate effective	Responses to essay	of students will	of students were	students were able	curricular or		
communication skills	questions in exams	score 80% or better	able to	to communicate	pedagogical		
and behaviors with	1, 2, and 3	on essay questions.	communicate their	their knowledge on	changes needed at		
colleagues in the			knowledge on the	the essay questions	this time		
program and in the		N 2 1000/	essay questions	N/ 2 A 11	M ON		
laboratory	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	Affective Domain	of students will	of students use	students can	changes needed at		
	Assessment in	receive	professional and	communicate better	this time		
	laboratory section regarding	"satisfactory" marks in	assertive communication	as the course			
	communication.	communication-	with fellow students	progresses			
	Communication.	related objectives in	and instructor in the				
		Affective Domain	laboratory.				
		Assessment	iauuraiury.				
		Assessinent					

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

** MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 2210 is an introductory immunohematology course covering the theory and principles of Immunohematology relevant to blood group serology, antibody detection and identification, compatibility testing, component preparation and therapy in blood transfusion service, quality control, donor screening and phlebotomy, transfusion reactions and hemolytic disease of the fetus and newborn. MLS 2210 contains all eight of the program's identified learning goals, though in appropriately varying amounts. As noted in the curriculum map, learning goals 2,4,5,6 and 8 are areas of introduction, learning goal 1 is emphasized, and learning goals 3 and 7 are utilized. In all cases, the measures show that 100% of the students are reaching all 8 goals at levels of 80% or above, so no curricular or clinical changes are seen as needed at this time. Data in this table are derived from five sections of the course taught in Spring 2019 by Justin Rhees. This course was previously listed at MLS 2215 and was taught by Bill Zundel and Janet Oja from 2008-2018.

Evidence of Learning: Courses within the Major: MLS 2211 Principles of Clinical Chemistry I

	Evidence of Learning: MLS 2211							
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of			
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**			
		Student Learning						
Students will	Direct and Indirect							
	Measures*							
Learning Outcome 1:	Measure 1: Each	Measure 1: Each	Measure 1: All	Measure 1: All	Measure 1:			
Demonstrate	exam covers testing	student must	students with	students with	Findings indicate			
knowledge of theory	specific to the	complete the exam	passing grades	passing grades	no changes are			
underlying laboratory	covered units.	with a score of at	achieved a score of	showed an	needed at this time.			
testing using analytical,		least 80%.	at least 80% on	acceptable level of				
interpretive, and			each unit exam.	understanding of				
problem solving skills.				the theory behind				
				the testing				
				discussed.				
	Measure 2:	Measure 2: The	Measure 2: All	Measure 2: All	Measure 2:			
	Students will	total points earned	students with	students with	Findings indicate			
	complete	from the laboratory	passing grades	passing grades				

	Evidence of Learning: MLS 2211						
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
	Measures* laboratory exercises, which require understanding of the testing methods.	must equal at least 80% of the points possible.	earned at least 80% of the total points possible.	showed competency of the covered topics and laboratory exercises.	no changes are needed at this time.		
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Students must complete a 40- question lab math exam before beginning lab work. Questions are repeated throughout the year to help students remember	Measure 1: Each student must pass the exam with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80%.	Measure 1: All students with a passing grade can successfully complete laboratory mathematics. Continual exposure to math throughout the year, assists with memory.	Measure 1: Instituted review questions in all subsequent examinations		
	Measure 2: Graded laboratory exercises, which include calculations.	Measure 2: All students must correctly complete laboratory calculations.	Measure 2: All students with passing grades earned at least 80% of the total points possible.	Measure 2: All students with passing grades can successfully complete laboratory mathematics.	Measure 2: Findings indicate no changes are needed at this time.		
Learning Outcome 3: Perform laboratory procedures from simple to complex, including	Measure 1: Students will complete a laboratory final	Measure 1: All students must complete the laboratory final	Measure 1: All students with passing grades	Measure 1: All students with passing grades can successfully	Measure 1: Findings indicate no changes are needed at this time.		

		Evidence of Learn	ing: MLS 2211		
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
specimen collection and processing, analysis, interpretation, and use of quality	with several exercises ranging in difficulty.	with a score of at least 80%.	earned a score of at least 80%.	complete laboratory testing procedures ranging in difficulty.	
assurance procedures.	Measure 2: Demonstrate knowledge of accurate sample requirements and collection procedures.	Measure 2: Students will assess samples submitted for testing for acceptability.	Measure 2: All students with passing grades have accurately demonstrated knowledge of sample requirements.	Measure 2: All students can assess samples for testing as appropriate.	Measure 2: Instituted clinical correlation exercises which deal with patient pathologies and specimen issues in testing to better inform the students regarding sample requirements and collection procedures
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students will correlate theory and terminology in all laboratory exercises.	Measure 1: Students will complete all laboratory correlation activities with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can correlate theory to practical laboratory situations.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Students must test unknown samples	Measure 2: Students must complete the	Measure 2: All students with passing grades	Measure 2: All students with passing grades can correlate theory to	Measure 2: Findings indicate no changes are needed at this time.

	Evidence of Learning: MLS 2211						
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
	during laboratory exercises.	laboratory section with at least 80%.	earned a score of at least 80%.	practical laboratory situations.			
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: Students must gather all applicable data regarding the patient and use it for a tentative diagnosis Measure 2: Not applicable.	Measure 1: Students must obtain all pertinent information which is scored on their laboratory section, which must be at least 80% Measure 2: Not applicable.	Measure 1: All students with passing grades earned a score of at least 80% Measure 2: Not applicable.	Measure 1: All students with passing grades can gather laboratory data and use it to solve problems and discrepancies Measure 2: Not applicable.	Measure 1: Instituted QC labs prior to the introduction of a new test. Also instituted a Levy- Jennings problem- solving worksheet Measure 2: Not applicable.		
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Each unit exam will test the student's ability to correlate laboratory findings to common diseases. Measure 2: Laboratory exercises require students to use disease correlation to laboratory	Measure 1: Each student must pass the exam with a score of at least 80%. Measure 2: Students must identify laboratory results that are not consistent with patient diagnoses.	Measure 1: All students with passing grades earned a score of at least 80%. Measure 2: All students with passing grades have accurately correlated laboratory findings	Measure 1: All students with passing grades can accurately correlate laboratory findings to common diseases. Measure 2: All students with passing grades can correlate laboratory findings to disease	Measure 1: Findings indicate no changes are needed at this time. Measure 2: Findings indicate no changes are needed at this time.		

	Evidence of Learning: MLS 2211					
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**	
	findings as a QA tool.		on assigned laboratory activities.	states covered in the course.		
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Unit 1 test contains questions to include professional behavior.	Measure 1:Students must pass the test with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80% on the test.	Measure 1: All students with passing scores have an introductory understanding of professional behavior.	Measure 1: Findings indicate no changes are needed at this time.	
	Measure 2: Adherence to proper laboratory dress code and common regulatory requirements (i.e. HIPPA)	Measure 2: Students must comply with dress code requirements for safety and HIPPA requirements.	Measure 2: All students with passing grades properly gowned laboratory clothing (i.e. lab coat) and showed compliance to HIPPA regulations they were exposed to.	Measure 2: All students with passing grades are aware of proper laboratory attire and HIPPA regulations that are discussed.	Measure 2: Findings indicate no changes are needed at this time.	
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the	Measure 1: Laboratory exercises require students to communicate	Measure 1: All students must accurately identify all critical values and properly report	Measure 1: All students with passing grades were able to	Measure 1: All students with passing grades know the importance of	Measure 1: Findings indicate no changes are needed at this time.	

		Evidence of Learn	ing: MLS 2211		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**
		Student Learning			
Students will	Direct and Indirect				
	Measures*				
program and in the	critical values to	them to the	identify critical	prompt and	
laboratory	the healthcare	provider.	values.	professional	
	provider.			interaction.	
	Measure 2:	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:
	Instructor/	students must	students with a	students with	Findings indicate
	Professor	adhere to the no	passing grade have	passing grades	no changes are
	observation of	hazing policy	interacted	know the	needed at this time.
	interactions	outlined in the	appropriately with	importance of	
	amongst peers.	course syllabus.	their colleagues.	prompt and	
				professional	
				interaction.	

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 2211 is an introductory clinical chemistry course covering the theory and principles of clinical chemistry, including laboratory math, basic instrumentation, carbohydrates, lipids, electrolytes, and acid-base balance. MLS 2211 contains all of the eight identified learning goals. The exposure level of each goal in this course is appropriate for the introductory students. Evidence of Learning: Courses within the Major: MLS 2213 Principles of Clinical Chemistry II

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing.

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: Each exam covers testing specific to the covered units.	Measure 1: Each student must complete the exam with a score of at least 80%.	Measure 1: All students with passing grades achieved a score of at least 80% on each unit exam.	Measure 1: All students with passing grades showed an acceptable level of understanding of the theory behind the testing discussed.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Students will complete laboratory exercises, which require understanding of the testing methods.	Measure 2: The total points earned from the laboratory must equal at least 80% of the points possible.	Measure 2: All students with passing grades earned at least 80% of the total points possible.	Measure 2: All students with passing grades showed competency of the covered topics and laboratory exercises.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Students must complete a 40- question lab math exam before beginning lab work. Questions are repeated throughout the year to help students remember	Measure 1: Each student must pass the exam with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80%.	Measure 1: All students with a passing grade can successfully complete laboratory mathematics. Continual exposure to math throughout the year, assists with memory.	Measure 1: Instituted review questions in all subsequent examinations

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
	Measure 2: Graded laboratory exercises, which include calculations.	Measure 2: All students must correctly complete laboratory calculations.	Measure 2: All students with passing grades earned at least 80% of the total points possible.	Measure 2: All students with passing grades can successfully complete laboratory mathematics.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality	Measure 1: Students will complete a laboratory final with several exercises ranging in difficulty.	Measure 1: All students must complete the laboratory final with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can successfully complete laboratory testing procedures ranging in difficulty.	Measure 1: Findings indicate no changes are needed at this time.
assurance procedures.	Measure 2: Demonstrate knowledge of accurate sample requirements and collection procedures.	Measure 2: Students will assess samples submitted for testing for acceptability.	Measure 2: All students with passing grades have accurately demonstrated knowledge of sample requirements.	Measure 2: All students can assess samples for testing as appropriate.	Measure 2: Instituted clinical correlation exercises which deal with patient pathologies and specimen issues in testing to better inform the students regarding sample requirements and collection procedures

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students will correlate theory and terminology in all laboratory exercises.	Measure 1: Students will complete all laboratory correlation activities with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can correlate theory to practical laboratory situations.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Students must test unknown samples during laboratory exercises.	Measure 2: Students must complete the laboratory section with at least 80%.	Measure 2: All students with passing grades earned a score of at least 80%.	Measure 2: All students with passing grades can correlate theory to laboratory situations.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: Students must gather all applicable data regarding the patient and use it for a tentative diagnosis	Measure 1: Students must obtain all pertinent information which is scored on their laboratory section, which must be at least 80%	Measure 1: All students with passing grades earned a score of at least 80%	Measure 1: All students with passing grades can gather laboratory data and use it to solve problems and discrepancies	Measure 1: Instituted QC labs prior to the introduction of a new test. Also instituted a Levy- Jennings problem- solving worksheet
	Measure 2: Most laboratory activities require the students to troubleshoot specimen/result discrepancies.	Measure 2: All Students must correct discrepancies in order to report out correct results with	Measure 2: All students with passing grades earned a score of at least 80%.	Measure 2: All students with passing grades are able to identify and correct discrepancies in	Measure 2: Findings indicate no changes are needed at this time.

Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*	at least 80% accuracy.		order to provide accurate results.	
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Each unit exam will test the student's ability to correlate laboratory findings to common diseases.	Measure 1: Each student must pass the exam with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can accurately correlate laboratory findings to common diseases.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Laboratory exercises require students to use disease correlation to laboratory findings as a QA tool.	Measure 2: Students must identify laboratory results that are not consistent with patient diagnoses.	Measure 2: All students with passing grades have accurately correlated laboratory findings on assigned laboratory activities.	Measure 2: All students with passing grades can correlate laboratory findings to disease states covered in the course.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: The final exam contains questions that cover professional behavior.	Measure 1:Students must pass the test with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80% on the test.	Measure 1: All students with passing scores have an introductory understanding of professional behavior.	Measure 1: Findings indicate no changes are needed at this time.

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
	Measure 2: Adherence to proper laboratory dress code and common regulatory requirements (i.e. HIPAA)	Measure 2: Students must comply with dress code requirements for safety and HIPAA requirements.	Measure 2: All students with passing grades properly gowned laboratory clothing (i.e. lab coat) and showed compliance to HIPAA regulations they were exposed to.	Measure 2: All students with passing grades are aware of proper laboratory attire and HIPAA regulations that are discussed.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the laboratory	Measure 1: Laboratory exercises require students to communicate critical values to the healthcare provider.	Measure 1: All students must accurately identify all critical values and properly report them to the provider.	Measure 1: All students with passing grades were able to identify critical values.	Measure 1: All students with passing grades know the importance of prompt and professional interaction.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Instructor/ Professor observation of interactions amongst peers.	Measure 2: All students must adhere to the no hazing policy outlined in the course syllabus.	Measure 2: All students with a passing grade have interacted appropriately with their colleagues.	Measure 2: All students with passing grades know the importance of prompt and professional interaction.	Measure 2: Findings indicate no changes are needed at this time.

Summary: MLS 2213 is the second semester of the introductory clinical chemistry course covering the theory and principles of clinical chemistry, including proteins and non-protein nitrogens, enzymology, endocrinology, therapeutic drug monitoring, toxicology, analytical principles, heme derivatives, and body fluids. MLS 2213 contains all of the eight identified learning goals. The exposure level of each goal in this course is appropriate for the introductory students.

Evidence of Learning: Courses within the Major: MLS 3302 Biostatistics, Research Methods, and Laboratory Practices

Evidence of Learning: Courses within the Major							
Measurable Learning	Method of	Threshold for	Findings Linked	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	to Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 1:	Measure 1: Exam	Measure 1: 100%	Measure 1: 84%	Measure 1: four	Measure 1: No		
Demonstrate knowledge	three focused on	of students will	of students scored	students did not	changes are		
of theory underlying	pre-use validation	score at least 80%	an 80% or better	achieve 80% but	needed to this		
laboratory testing using	of clinical	on this exam	(range: 58 – 100)	upon retake they	unit exam		
analytical, interpretive,	instrumentation			earned the			
and problem-solving				required 80%			
skills.				grade			
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	Problem based	of students will	of students scored	students	changes are		

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing.

Evidence of Learning: Courses within the Major							
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
Students will	Measures* practical exam containing a five- part pre-use validation of a new clinical test.	score at least 80% on the practical exam	an 80% or better (range: 85-100)	performed adequately on applying their knowledge in a problem-based assignment	needed to this unit practical (changes were made to make it easier for students to perform calculations not directly taken from CLSI standard manual)		
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: A series of homework assignments (n= 14) covering; t- Test, F-Test, ANOVA, Chi- Squared Test, Correlation, Reference Ranges, Standard Error of the Mean, Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, Accuracy,	Measure 1: 100% of students will compute and interpret the findings.	Measure 1: 100% of students completed all homework assignments and either interpreted their findings correctly or understood where they made an error	Measure 1: All students were able to apply common laboratory mathematical calculations and understand their results	Measure 1: No changes are needed to these series of homework assignments		

Measurable Learning Goal	Evider Method of Measurement	nce of Learning: Cour Threshold for Evidence of Student Learning	rses within the Major Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures* Precision, Minimum Detection Limit				
	Measure 2: Two problem based practical exams	Measure 2: 100% of students will score at least 80% on the practical exam	Measure 2: 100% of students scored an 80% or better (range: 83-100)	Measure 2: All students were able to apply mathematical calculations to real laboratory situations	Measure 2: No changes are needed to the two practical exams
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	This course focuses on advanced application of laboratory mathematical theory, research methods, and financial lab management. As such, there are no 'wet' lab procedures taught or conducted. The students do participate in a computer lab.	NA	NA	NA	NA

Evidence of Learning: Courses within the Major						
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**	
Students will	Direct and Indirect Measures*	_				
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Three (total= 4) unit examinations focus on theory and application of advanced laboratory practices	Measure 1: 100% of students will score at least 80% on this exam	Measure 1: 84% of students scored an 80% or better (range 58-100) These data were compiled across three examinations regarding the LO4.	Measure 1: 8 students individually did not achieve 80% across on of the three unit exams but upon retake they earned the required 80% grade	Measure 1: No changes are needed for these examinations	
	Measure 2: A series of homework assignment (n=18)	Measure 2: 100% of students will complete the assignment and interpret their findings	Measure 1: 100% of students completed all homework assignments and either interpreted their findings correctly or understood where they made an error	Measure 2: All students were able to apply common laboratory mathematical calculations and understand their results	Measure 2: No changes are needed to these assignments	
	Measure 3: Two problem based practical examinations	Measure 3: 100% of students will score at least 80% on the practical exam	Measure 3: 100% of students scored an 80% or better (range: 83-100)	Measure 3: All students were able to apply advanced laboratory theory to practical situations	Measure 3: No changes are needed to these practical exams	

	Evider	nce of Learning: Cour	ses within the Major		
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Measure 1: One unit problem based practical examination (specifically values on the low end of linear range appeared to be suitable until the examination of bias plots)	Measure 1: 100% of students will score at least 80% on the practical exam	Measure 1: 100% of students scored an 80% or better	Measure 1: All students were able to apply advanced laboratory theory to practical situations	Measure 1: No changes are needed to these practical exams
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Research article critique assignment (students select a primary research article to present to the class, often contain clinically relevant laboratory data and disease characterizations)	Measure 1: 100% of students must demonstrate adequate presentation and written skills to convey critical findings, conclusions, and critiques	Measure 1: 100% of students demonstrated an ability to communicate a critical examination of a primary research article.	Measure 1: All students were able to interpret and explain the crucial methods, results, and conclusions of their selected research article and understand how their laboratory results did or did not lead to the conclusions the authors made.	Measure 1: No changes are needed to this assignment

		•	rses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	to Learning	Findings	of Results**
	D. 17 1.	Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*	NT A	NT A	NT A	NT A
Learning Outcome 7:	This is a theory	NA	NA	NA	NA
Demonstrate	and application based course that				
professional conduct and ethical behavior	does not focus or				
and ethical behavior	measure				
	professionalism or				
	ethical behavior				
Learning Outcome 8:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	Research article	of students must	of students	students were	changes are
communication skills	critique	demonstrate	demonstrated an	able to interpret	needed to this
and behaviors with		adequate	ability to	and explain the	assignment
colleagues in the		presentation and	communicate a	crucial methods,	
program and in the		written skills to	critical	results, and	
laboratory		convey critical	examination of a	conclusions of	
		findings,	primary research	their selected	
		conclusions, and	article.	research article	
		critiques		and understand	
				how their	
				laboratory results	
				did or did not lead	
				to the conclusions	
				the authors made.	

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS3302: Biostatistics, Research Methods, and Laboratory Practices is a course that covers advanced theory and application of mathematics, research concepts, and financial management practices in the clinical laboratory. This course contains four units

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

that cover; basic statistics, experimental/research study design, critiquing and interpreting of research articles, laboratory instrumentation testing and pre-use validation, and laboratory financial management (healthcare reimbursement, financial cost analysis, laboratory budgets, workload recording, and inventory forecasting). MLS3302 is a focused advanced level course that deals with very specific areas of clinical laboratory operation and theory. As such, it does not contain all eight of the MLS department program goals. The goals that are covered; 1-6 & 8, are covered to a high degree (to the utilization level or higher). These data are collected from a single on campus section in the Fall semester from 2018. This population consisted of a total of 21 students and is typical of the campus cohorts I have taught over the last seven years. I have made learning outcome improvements to the course over the seven years I have taught it; the changes I have mostly relate to improved language used in examinations, improving walkthrough laboratory assignments to better teach students to learn statistical software such as R, and adding periodic quizzes to prepare students for the type of questions I will be asking in each unit. I believe in testing with a variety of multiple choice and written questions, with the written essay questions often giving our students the most difficulty. The 'labs' in this course are computer based laboratories lead by the instructor and guided by online walkthroughs that I have created that teach students to: upload a data set, perform basic graphical and statistical procedures, and interpret the results of those procedures with a particular interest in the resolving of issues.

Evidence of Learning: Courses within the Major: MLS 3310 Advanced Immunohematology

	Evidence of Learning: Courses within the Major							
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of			
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**			
		Learning						
Students will	Direct and Indirect							
	Measures*							
Learning Outcome 1:	Measure 1: A set of	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No			
Demonstrate	10 multiple choice	of students will	of students scored	students	curricular or			
knowledge of theory	questions from	score 80% or better	80% or better on 10	successfully	pedagogical			
underlying laboratory	Exam 1 and Quiz 1	on 10 questions	questions	demonstrated	changes needed at			
testing using analytical,				theory underlying	this time			
interpretive, and				laboratory testing				
problem solving skills.	Measure 2: 11	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No			
	graded laboratory	of students will	of students were	students correctly	clinical changes			
	practice sessions	correctly perform	able to correctly	performed required	needed at this time			
	and 2 practical	required laboratory	perform required	laboratory skills				
	exams	skills	laboratory skills					
Learning Outcome 2:	Measure 1: A set of	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No			
Apply mathematical	20 multiple choice	of students will	of students scored	students	curricular or			
calculations to	questions from	score 80% or better	80% or better on 20	successfully applied	pedagogical			
laboratory situations.	Exams 2 and Final	on 20 questions.	questions.	mathematical	changes needed at			
	Exam			calculations to	this time			
				laboratory				
				situations.				
	Measure 2: 2	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No			
	graded laboratory	of students will	of students	students correctly	clinical changes			
	applications of	correctly perform	correctly performed	performed	needed at this time			
	laboratory	mathematical	mathematical	mathematical				
	mathematical	calculations in	calculations in	calculations in				
	calculations	laboratory	laboratory	laboratory				
		situations.	situations.	situations.				

Evidence of Learning: Courses within the Major								
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**			
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 1: A set of 20 multiple choice questions from Exams 1 and 2 related to performance of laboratory procedures, specimen collection and processing, analysis, and QA.	Measure 1: 100% of students will score 80% or better on 20 questions	Measure 1: 96% of students scored 80% or better on 20 questions.	Measure 1: All students successfully demonstrated knowledge of evaluating specimen acceptability and optimal analysis methods.	Measure 1: No curricular or pedagogical changes needed at this time			
	Measure 2: Demonstrate proper knowledge of specimen criteria in a blood bank laboratory setting.	Measure 2: 100% of students will correctly determine proper sample suitability. Students to perform QC on all blood bank reagents	Measure 2: 100% of students were able to correctly determine proper sample suitability for blood bank analysis. QC results accurate.	Measure 2: All students correctly determined proper sample suitability.	Measure 2: No clinical changes needed at this time			
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: A set of 20 multiple choice questions from Exams 1 and 2.	Measure 1: 100% of students will score 80% or better on 20 questions.	Measure 1: 100% of students scored 80% or better on 20 questions	Measure 1: All students successfully correlated laboratory theory and terminology to practical laboratory work.	Measure 1: No curricular or pedagogical changes needed at this time			

	Evidence of Learning: Courses within the Major								
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**				
Students will	Direct and Indirect Measures*								
	Measure 2: Assess unknowns with accuracy during 2 laboratory practical exams	Measure 2: 100% of students will score 80% or better on 2 laboratory practical exams	Measure 2: 99% of students scored 80% or better on 2 laboratory practical exams.	Measure 2: Most students performed the required skills during the 2 laboratory practical exams.	Measure 2: No clinical changes needed at this time				
Learning Outcome 5: Gather additional laboratory data and apply problem-solving skills to solve problems/discrepancies.	Measure 1: A set of 20 multiple choice questions from Exams 2 and 3.	Measure 1: 100% of students will score 80% or better on 20 questions.	Measure 1: 100% of students scored 80% or better on 20 questions.	Measure 1: All students successfully demonstrated problem solving skills	Measure 1: No curricular or pedagogical changes needed at this time				
	Measure 2: Students resolve discrepancies in the 11 laboratory sessions and must correlate patient history to laboratory findings	Measure 2: 100% of students will correctly resolve discrepancies in the 11 laboratory sessions and correlate patient history to laboratory findings	Measure 2: 100% of students were able to correctly resolve discrepancies in the 11 laboratory sessions and correlate patient history to laboratory findings	Measure 2: All students correctly resolved discrepancies in the 11 laboratory sessions and correlated patient history to laboratory findings	Measure 2: No clinical changes needed at this time				
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: A set of 25 questions from Exams 2, 3, and the Final Exam	Measure 1: 100% of students will score 80% or better on 25 questions.	Measure 1: 100% of students scored 80% or better on 25 questions	Measure 1: All students correctly related laboratory findings to common diseases.	Measure 1: No curricular or pedagogical changes needed at this time				

	Evidence of Learning: Courses within the Major							
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of			
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**			
Students will	Direct and Indirect Measures*							
	Measure 2: In 2 laboratory sessions students relate laboratory findings to common diseases	Measure 2: 100% of students will perform the required skills in the laboratory	Measure 2: 100% of students were able to relate laboratory findings to common diseases.	Measure 2: All students correctly related laboratory findings to common diseases.	Measure 2: No clinical changes needed at this time			
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: 100% of students will attend laboratory section and be punctual.	Measure 1: 100% attendance in laboratory section. 89% punctuality	Measure 1: All students attended laboratory section and most were punctual	Measure 1: No curricular or pedagogical changes needed at this time			
	Measure 2: Adherence to laboratory dress code and safety procedures	Measure 2: 100% of students will comply with dress code and safety procedures.	Measure 2: 100% of students complied with dress code and safety procedures	Measure 2: All students were in compliance with dress code and safety procedures.	Measure 2: No clinical changes needed at this time			
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the	Measure 1: 3 Essay questions on exam 3.	Measure 1: 100% of students will score 80% or better on essay questions.	Measure 1: 100% of students were able to communicate their knowledge on the essay questions	Measure 1: All students were able to communicate their knowledge on the essay questions	Measure 1: No curricular or pedagogical changes needed at this time			
laboratory	Measure 2: Affective Domain Assessment in laboratory measuring	Measure 2: 100% of students will receive "satisfactory" marks on Affective Domain	Measure 2: 100% of students communicate effectively in the group setting	Measure 2: All students can communicate better as the course progresses	Measure 2: No clinical changes needed at this time			

Evidence of Learning: Courses within the Major									
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of				
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**				
		Learning							
Students will	Direct and Indirect								
	Measures*								
	communication	Assessment							
	skills.	measuring							
		communication							
		skills.							

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 3310 is an advanced immunohematology course covering advanced blood banking theory and specialized procedures of immunohematology relevant to blood group serology, antibody detection and identification, compatibility testing, component preparation and therapy in blood transfusion service, quality control, donor screening and phlebotomy, transfusion reactions and hemolytic disease of the fetus and newborn. MLS 3310 contains all eight of the program's identified learning goals, though in appropriately varying amounts. As noted in the curriculum map, learning goals 1, 2, 4, 5, and 8 are areas of utilization, learning goal 6 is emphasized, and learning goals 3 and 7 are assessed comprehensively. In all cases, the measures show that 100% of the students are reaching all 8 goals at levels of 80% or above, so no curricular or clinical changes are seen as needed at this time. Data in this table are derived from five sections of the course taught in fall 2018-2019 by Justin Rhees. This course was previously listed as MLS 3311 and was taught by Bill Zundel and Janet Oja from 2008-2018.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 3313 Advanced Hematology and Hemostasis

	Evi	dence of Learning: Co	urses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
		Learning			
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 1:	Measure 1: The	Measure 1: > 90%	Measure 1: 95% of	Measure 1: 95% of	Measure 1: No
Demonstrate	Unit 1 exam tests	of students must	students scored	students	curricular or
knowledge of theory	the principles of	score 80% or better	80% or better on	successfully	pedagogical
underlying laboratory	hematology testing.	on exams, proving	both exams.	demonstrated	changes needed at
testing using analytical,	The Unit 5 exam	competency. If they		theory underlying	this time
interpretive, and	tests the principles	do not score above		laboratory testing	
problem-solving skills.	of hemostasis	80%, they are			
	testing. 50 multiple	required to score well on a retake			
	choice questions each.				
	eacii.	exam to prove competency.			
	Measure 2: 11	Measure 2: >90%	Measure 2: 100%	Measure 2: All	Measure 2: No
	graded laboratory	of Students are	of students were	students correctly	clinical changes
	practice sessions	required to score	able to correctly	performed required	needed at this time
	and 2	above an 80% in	perform required	laboratory skills	
	comprehensive lab	laboratory skills	laboratory skills	J	
	practical's.	and competencies.	,		
Learning Outcome 2:	Measure 1: Many	Measure 1: >90%	Measure 1: 95% of	Measure 1: 95% of	Measure 1: No
Apply mathematical	multiple-choice	of students will	students scored	students	curricular or
calculations to	questions requiring	score 80% or better	80% or better on 8	successfully applied	pedagogical
laboratory situations.	mathematical	on these questions.	questions.	mathematical	changes needed at
	calculations in			calculations to	this time
	exam 1, 2 and 5			laboratory	
				situations.	
	Measure 2:	Measure 2: >90%	Measure 2: 100%	Measure 2: 100%	Measure 2: No
	Laboratory sessions	of students will	of students	of students	clinical changes
	requiring	correctly perform	correctly performed	correctly performed	needed at this time

	Evi	dence of Learning: Co	ourses within the Major	•	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 3: Perform laboratory procedures from simple to complex, including	applications of laboratory mathematical calculations Measure 1: 50 multiple choice questions from Exam 1 and 10	mathematical calculations in laboratory situations. Measure 1: >90% of students will score >80% on 60 questions	mathematical calculations in laboratory situations. Measure 1: 95% of students scored 80% or better on 20 questions.	mathematical calculations in laboratory situations. Measure 1: 95% of students successfully demonstrated	Measure 1: No curricular or pedagogical changes needed at
specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	multiple choice questions from Exam 5			knowledge of evaluating specimen acceptability and optimal analysis methods.	this time
	Measure 2: Demonstrate proper knowledge of specimen criteria in a hematology laboratory setting	Measure 2: >90% of students will correctly determine proper sample suitability.	Measure 2: >95% of students were able to correctly determine proper sample suitability for hematology analysis	Measure 2: All students correctly determined proper sample suitability.	Measure 2: No clinical changes needed at this time
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: 50 multiple choice questions each from exams 2, 3, and 4	Measure 1: >90% of students will score 80% or better on all questions.	Measure 1: >95% of students scored 80% or better on 20 questions	Measure 1: >95% of students successfully correlated laboratory theory and terminology to practical laboratory work.	Measure 1: No curricular or pedagogical changes needed at this time

	Evi	dence of Learning: Co	urses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect				
	Measures*				
	Measure 2:	Measure 2: >90%	Measure 2: >95%	Measure 2: >95%	Measure 2: No
	Evaluate abnormal	of students will	of students scored	of students	clinical changes
	hematology smears	score 80% or better	80% or better on	performed the	needed at this time
	from a wide variety	on the laboratory	the laboratory	required skills	
	of disorders during	practical exam and	practical exam and	during the	
	6 laboratory	participate in all	participated in all	laboratory practical	
	sessions. Assess competency during	required laboratory sessions.	required laboratory sessions.	exam and required laboratory sessions.	
	1 laboratory	SCSSIOIIS.	SCSSIOIIS.	laboratory sessions.	
	practical exam				
Learning Outcome 5:	Measure 1: A set of	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No
Gather additional	15 multiple choice	of students will	of students scored	of students	curricular or
laboratory data and	questions from	score 80% or better	80% or better on 20	successfully	pedagogical
apply problem solving	Exams 1 and 5	on 20 questions.	questions.	demonstrated	changes needed at
skills to solve				problem solving	this time
problems/discrepancies.				skills	
	Measure 2:	Measure 2: >90%	Measure 2: >95%	Measure 2: >95%	Measure 2: No
	Students correlate	of students will	of students were	of students	clinical changes
	patient history and	correctly correlate	able to correctly	correctly correlated	needed at this time
	diagnoses to	patient history and diagnoses to	correlate patient	patient history and diagnoses to	
	laboratory findings in 6 laboratory	laboratory findings	history and diagnoses to	laboratory findings	
	sessions	in 6 laboratory	laboratory findings	in 6 laboratory	
	303310113	sessions	in 6 laboratory	sessions	
			sessions		
Learning Outcome 6:	Measure 1: 50	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No
Relate laboratory	multiple choice	of students will	of students scored	of students	curricular or
findings to common	questions each from	score 80% or better	80% or better on 50	correctly related	pedagogical
disease.	exams 2, 3, and 4,	on 50 multiple	multiple choice	laboratory findings	

	Evi	dence of Learning: Co	urses within the Major	•	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
	and 25 questions from exam 5.	choice questions each from exams 2, 3, and 4, and 25 questions from exam 5.	questions each from exams 2, 3, and 4, and 25 questions from exam 5.	to common diseases.	changes needed at this time
	Measure 2: In 6 laboratory sessions students relate laboratory findings to common diseases	Measure 2: >90% of students will perform the required skills in the laboratory	Measure 2: 100% of students were able to relate laboratory findings to common diseases.	Measure 2: >95% of students correctly related laboratory findings to common diseases.	Measure 2: No clinical changes needed at this time
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: >95% of students will attend laboratory section and be punctual.	Measure 1: 100% attendance in laboratory section. >95% punctuality	Measure 1: >95% of students attended laboratory section and most were punctual	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: Adherence to laboratory dress code and safety procedures	Measure 2: >95% of students will comply with dress code and safety procedures.	Measure 2: 100% of students complied with dress code and safety procedures	Measure 2: >95% of students were in compliance with dress code and safety procedures.	Measure 2: No clinical changes needed at this time
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the	Measure 1: Laboratory etiquette and expectations are defined in the syllabus. Measured	Measure 1: >95% of students will be punctual to laboratory sessions, and remain task-	Measure 1: >95% of students were punctual to laboratory sessions, and remained task-	Measure 1: >95% of students demonstrated effective communication	Measure 1: No curricular or pedagogical changes needed at this time
program and in the laboratory	by punctuality and participation.	oriented throughout the session in order	oriented throughout the session and	skills through punctuality and	

Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of	
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**	
		Learning				
Students will	Direct and Indirect					
	Measures*					
		to receive full	received full	tasks during		
		participation credit.	participation credit.	laboratory sessions.		

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 3313 is an Advanced Hematology course covering:

- Hematology and hemostasis relevant to routine laboratory testing
- Normal erythrocyte physiology and abnormal erythrocyte associated disorders
- Normal leukocyte physiology and abnormal leukocyte associated non-malignant and malignant blood disorders
- Normal platelet and coagulation physiology and associated disorders.

MLS 3313 contains all eight of the program's identified learning goals in varying amounts. As noted in the curriculum map, learning goals 5 and 8 are areas of introduction, learning goals 1 and 3 are emphasized, and learning goals 2, 4, 6, and 7 are utilized.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

$\underline{\text{Evidence of Learning: Courses within the Major: MLS 3314}}$

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: Each exam covers testing specific to the covered units.	Measure 1: Each student must complete the exam with a score of at least 80%.	Measure 1: All students with passing grades achieved a score of at least 80% on each unit exam.	Measure 1: All students with passing grades showed an acceptable level of understanding of the theory behind the testing discussed.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Students will complete laboratory exercises, which require understanding of the testing methods.	Measure 2: The total points earned from the laboratory must equal at least 80% of the points possible.	Measure 2: All students with passing grades earned at least 80% of the total points possible.	Measure 2: All students with passing grades showed competency of the covered topics and laboratory exercises.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Multiple exams include questions covering reactions specific to that unit.	Measure 1: Each student must pass the exam with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80%.	Measure 1: All students with a passing grade can successfully complete laboratory mathematics.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Graded laboratory exercises, which	Measure 2: All students must correctly complete	Measure 2: All students with passing grades	Measure 2: All students with passing grades can	Measure 2: Findings indicate

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
	include calculations.	laboratory calculations.	earned at least 80% of the total points possible.	successfully complete laboratory mathematics.	no changes are needed at this time.
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, (CONT) interpretation, and use	Measure 1: Students will complete a laboratory project that includes several exercises ranging in difficulty.	Measure 1: All students must complete the laboratory with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can successfully complete laboratory testing procedures ranging in difficulty.	Measure 1: Findings indicate no changes are needed at this time.
of quality assurance procedures.	Measure 2: Demonstrate knowledge of accurate sample requirements and collection procedures.	Measure 2: Students will assess samples submitted for testing for acceptability.	Measure 2: All students with passing grades have accurately demonstrated knowledge of sample requirements.	Measure 2: All students can assess samples for testing as appropriate.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students will correlate theory and terminology in all laboratory exercises.	Measure 1: Students will complete all laboratory correlation activities with a score of at least 80%.	Measure 1: All students with passing grades earned a score of at least 80%.	Measure 1: All students with passing grades can correlate theory to practical laboratory situations.	Measure 1: Findings indicate no changes are needed at this time.

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect				
	Measures*		2 411	3.6 2 4.11	
	Measure 2: Students must	Measure 2: Students must	Measure 2: All students with	Measure 2: All students with	Measure 2:
	complete the	complete the	passing grades	passing grades can	Findings indicate no changes are
	verification exercise	verification with at	earned a score of at	correlate theory to	needed at this time.
	that requires	least 80%.	least 80%.	laboratory	modera ar time time.
	knowledge of			situations.	
	theory.				
Learning Outcome 5:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:
Gather additional	Students will evaluate a	students must pass	students with	students with	Findings indicate
laboratory data and apply problem solving	collection of tests to	the panel exam with at least 80%.	passing grades earned a score of at	passing grades are able to correlate	no changes are needed at this time.
skills to solve	identify	at least 6070.	least 80%.	multiple results for	needed at this time.
problems/discrepancies.	discrepancies.			the identification of	
-	•			erroneous entries.	
	Measure 2: The	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:
	laboratory	Students must	students with	students with	Findings indicate
	verification exercise	correct	passing grades earned a score of at	passing grades are	no changes are needed at this time.
	will require the students to	discrepancies in order to report out	least 80%.	able to identify and correct	needed at this time.
	troubleshoot	verification results	icast 6070.	discrepancies in	
	multiple situations.	with at least 80%		order to provide	
	•	accuracy.		accurate results.	
Learning Outcome 6:	Measure 1: Each	Measure 1: Each	Measure 1: All	Measure 1: All	Measure 1:
Relate laboratory	unit exam will test	student must pass	students with	students with	Findings indicate
findings to common disease.	the student's ability to correlate	the exam with a score of at least	passing grades earned a score of at	passing grades can accurately correlate	no changes are needed at this time.
disease.	laboratory findings	80%.	least 80%.	laboratory findings	needed at this time.
	to common	22.0.		to common	
	diseases.			diseases.	

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
(CONT)	Measure 2: Class assignments will require the students to understand disease states in order to determine if the results are acceptable.	Measure 2: Students must identify laboratory results that are not consistent with patient diagnoses.	Measure 2: All students with passing grades have accurately correlated laboratory findings on assigned activities.	Measure 2: All students with passing grades can correlate laboratory findings to disease states covered in the course.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: The final exam contains 30 questions that cover professional behavior.	Measure 1:Students must pass the test with a score of at least 80%.	Measure 1: All students with passing grades scored at least 80% on the test.	Measure 1: All students with passing scores have an introductory understanding of professional behavior.	Measure 1: Findings indicate no changes are needed at this time.
	Measure 2: Adherence to proper laboratory dress code and common regulatory requirements (i.e. HIPAA)	Measure 2: Students must comply with dress code requirements for OSHA and HIPAA requirements.	Measure 2: All students with passing grades properly gowned laboratory clothing (i.e. lab coat) and showed compliance to HIPAA regulations they were exposed to.	Measure 2: All students with passing grades are aware of proper laboratory attire and HIPAA regulations that are discussed.	Measure 2: Findings indicate no changes are needed at this time.
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the	Measure 1: The verification exercise requires the students to submit a validation plan and	Measure 1: All verification and validation activities but earn a grade of at least 80%.	Measure 1: All students with passing grades earned at least 80% on the verification	Measure 1: All students with passing grades have shown appropriate written	Measure 1: Findings indicate no changes are needed at this time.

Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
		Learning			
Students will	Direct and Indirect				
	Measures*				
program and in the	an executive		and validation	communication	
laboratory	summary.		exercises.	skills.	
	Measure 2:	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:
	Instructor/	students must	students with a	students with	Findings indicate
	Professor	adhere to the no	passing grade have	passing grades	no changes are
	observation of	hazing policy	interacted	know the	needed at this time.
	interactions	outlined in the	appropriately with	importance of	
	amongst peers.	course syllabus.	their colleagues.	prompt and	
	_		_	professional	
				interaction.	

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 3314 is an advanced clinical chemistry course covering the theory and principles of clinical chemistry, including protein catabolism, carbohydrate metabolism, safety, regulatory agencies, non-protein nitrogen compounds, instrumentation validation, electrolyte balance, Lipids, enzymology, therapeutic drug monitoring, toxicology, analytical principles, and endocrinology. MLS 3314 contains all of the eight identified learning goals. The exposure level of each goal in this course is appropriate for the advanced students.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

	Evic	dence of Learning: Co	urses within the Major	•	
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical,	Measure 1: Student participation in physician guided correlation	Measure 1: All students required to attend and participate in discussion	Measure 1: All students participate in discussion	Measure 1: Student participation increases as semester progresses	Measure 1: No curricular or pedagogical changes needed at this time
interpretive, and problem solving skills.	Measure 2: None	Measure 2: None	Measure 2: None	Measure 2: None	Measure 2: No clinical changes needed at this time
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1N/A	Measure 1: No curricular or pedagogical changes needed at this time
and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time

	Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**		
		Student Learning					
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 4:	Measure 1:	Measure 1: The	Measure 1: This	Measure 1:	Measure 1:		
Correlate laboratory	Students must view	threshold for	course serves as a	Students increase	Because of these		
theory and terminology	pre-recorded	evidence of student	capstone to link the	their knowledge	results, and student		
to practical laboratory	lectures and take a	learning is 80% for	previously-learned	and empathy	preference, more		
work	quiz each week***	the overall quiz	learning objectives	toward patients and	student-directed		
		grade***	from multiple	disease***	cases have been		
			courses***		presented with a		
					pathologist's		
					guidance		
	Measure 2:	Measure 2: The	Measure 2: This	Measure 2:	Measure 2:		
	Students must	presentation should	course helps	Students gain a	Emphasis has been		
	appropriately	demonstrate a	students to link	greater	placed to ensure		
	present a case that	pathophysiologic	previously learned	understanding of	that the students		
	provides a teaching	mechanisms and	outcomes and	the application of	teach a practical		
	point and include	testing	testing	the didactic	application of		
	findings from 2	interferences	interferences with	knowledge and	testing during their		
	areas of the lab***	learned in the	actual	deeper	case		
		program***	pathologies***	understanding ***			
Learning Outcome 5:	Measure 1: ***	Measure 1: ***	Measure 1: ***	Measure 1: ***	Measure 1: No		
Gather additional					curricular or		
laboratory data and					pedagogical		
apply problem solving					changes needed at		
skills to solve	3.5 0 date	3.5 O district	3.5 0 dated	3.5 O district	this time		
problems/discrepancies.	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No		
					clinical changes		
					needed at this time		
		Ī	i e	Ī			

Evidence of Learning: Courses within the Major						
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**	
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Students must take a quiz on the weekly lecture video***	Measure 1: The threshold for evidence of student learning is 80% for the overall quiz grade***	Measure 1: This course serves as a capstone to link the previously-learned learning objectives from multiple courses ***	Measure 1: Students can easily correlate their laboratory findings with disease states***	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No clinical changes needed at this time	
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: 100% of students will attend and be punctual.	Measure 1: 95% punctuality	Measure 1: Most students were punctual	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: Observation of an educational case presentation***	Measure 2: Presenting an educational case to the class***	Measure 2: A requirement in the presentation assignment is to include 2 different areas of the lab that give practical application***	Measure 2: Students gained confidence in their presentation skills and clinicopathologic correlation***	Measure 2: No clinical changes needed at this time	
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the	Measure 1: Observation of conveyance of appropriate knowledge***	Measure 1: Effectively shared appropriate knowledge with the class***	Measure 1: Inclusion of 2 previously learned learning outcomes from 2 sections of	Measure 1: Students gain appropriate knowledge when	Measure 1: Began having students present cases for their learning	

	Evidence of Learning: Courses within the Major							
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of			
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**			
		Student Learning						
Students will	Direct and Indirect							
	Measures*							
program and in the			the lab is	presenting				
laboratory			required***	cases***				
	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No			
					curricular or			
					pedagogical			
					changes needed at			
					this time			

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 4409 - Clinical Correlation. This course is a 1 credit hour course which discusses correlations between laboratory data, patient diagnoses, and how it affects their lives. Dr. Scott Moore, a pathologist and Assistant Professor at Weber State Univeristy, presents cases and has physicians from the community visit occasionally to give their perspectives on patient care. During class time, the students begin by presenting an introductory case study, and work up to presenting full case studies of their choosing as a final project. The students are also assigned each week to watch one recorded lecture at home and take a quiz. This has been taught by Dr. Scott Moore since fall of 2017.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

^{***} This course is a 1 credit hour course. Case studies are presented and discussed with the students and correlations between laboratory data and patient diagnosis are evaluated. Dr. Moore will route the discussions to achieve the course objectives.

Evidence of Learning: Courses within the Major: MLS 4410 Interdisciplinary Healthcare Teams

Evidence of Learning: Courses within the Major								
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of			
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**			
		Student Learning						
Students will	Direct and Indirect							
	Measures*							
Learning Outcome 1:	Measure 1: Student	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No			
Demonstrate	will correctly	of students will	of students were	students correctly	curricular or			
knowledge of theory	correlate laboratory	correctly correlate	able to correctly	correlated the	pedagogical			
underlying laboratory	data with the	laboratory data	correlate the	laboratory data	changes needed at			
testing using analytical,	patient's clinical	with the patient's	laboratory data	with the patient's	this time			
interpretive, and	condition in case	clinical condition.	with the patient's	clinical condition.				
problem solving skills.	study presentation.		clinical condition.					
	Measure 2: Student	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No			
	will correctly	of students will	of students were	students correctly	clinical changes			
	correlate the	correctly correlate	able to correctly	correlated the	needed at this time			
	laboratory data	laboratory data	correlate the	laboratory data				
	with the patient's	with the patient's	laboratory data	with the patient's				
	clinical condition in	clinical condition.	with the patient's	clinical condition.				
	the		clinical condition.					
	interprofessional							
	simulation activity.							
Learning Outcome 2:	Measure 1: Student	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No			
Apply mathematical	will correctly	of students will	of students	students	curricular or			
calculations to	correlate perform	correctly perform	correctly	successfully	pedagogical			
laboratory situations.	mathematical	mathematical	performed	applied	changes needed at			
	calculations in case	calculations in case	mathematical	mathematical	this time			
	study presentation	study presentation	calculations in case	calculations in case				
	and in	and in	study presentation	study presentation				
	interprofessional	interprofessional	and in	and in				
	simulation.	simulation.	interprofessional	interprofessional				
			simulation.	simulation.				

Measurable Learning Goal Method of Measurement Measurement Students will Direct and Indirect Measures*	Evidence of Learning: Courses within the Major						
Students will Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Measure 1: Students will solve terminology to solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and Direct and Indirect Measures* Not Applicable Not Applica	2			\mathbf{c}		Action Plan/Use of	
Students will Direct and Indirect Measures* Not Applicable Not Applicable This course does not have a laboratory component.) Not Applicable No	Goal	Measurement		Learning Outcomes	Findings	Results**	
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Work Learning Outcome 5: Measure 1: Measure 1: Students will work in groups to Measure 1: Measure 1: Students will solve the multidisciplinary case studies. Measure 1: Measure 1: Students will solve the multidisciplinary case studies. Measure 1: Measure 1: Students will solve the practical laboratory with 100% accuracy. Measure 1: Measure 1: Students solved the multidisciplinary case studies by applying with 100% accuracy. Learning Outcome 5: Gather additional laboratory data and Measure 1: Measure 1: Measure 1: 100% accuracy. Measure 1: Measure 1: Measure 1: Measure 1: Students will solve the practical laboratory work presented in the multidisciplinary case study. Measure 1: Measure 1: Measure 1: Measure 1: Students will solve the practical laboratory work presented in the multidisciplinary case study. Measure 1: No curricular or pedagogical	G. 1	D' 17 17	Student Learning				
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Measure 1: Students will aboratory theory and terminology to solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and Not Applicable (This course does not have a laboratory component.) Not Applicable (Not Applicable) (Not Appl	Students will						
Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Learning Outcome 5: Gather additional laboratory data and in groups to in groups to compose to complex in cluding specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Measure 1: Measure 1: Students solved the successfully case studies by applying multidisciplinary case studies by and terminology to the practical laboratory work and terminology with 100% accuracy. Measure 1: Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. It is course does not have a laboratory component.) Measure 1: Measure 1: Students will our the multidisciplinary case studies with 100% accuracy. Measure 1: M	Lagraina Ontagas 2.		Not Applicable	Nat Applicable	Not Applicable	Not Applicable	
procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Measure 1: Students will solve the multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Learning Outcome 5: Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. Learning Outcome 5: Gather additional laboratory data and not have a laboratory alaboratory component.) Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. In Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. Measure 1: No curricular or pedagogical changes needed at this time the practical laboratory work presented in the multidisciplinary case study. Measure 1: Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. Measure 1: Measure 1:			Not Applicable	Not Applicable	Not Applicable	Not Applicable	
to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Measure 1: Students will solve the multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Measure 1: Students solved the multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Learning Outcome 5: Measure 1: Measure 1: Measure 1: Students solved the multidisciplinary case study. Measure 1: Measure 1: No curricular or pedagogical changes needed at this time Measure 1:		\					
specimen collection and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to solve multidisciplinary case studies. Weasure 1: Students will solve the multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Learning Outcome 5: Measure 1: Measure 1: Students will solve the multidisciplinary case study. Learning Outcome 5: Measure 1: Measure 1: Students solved the multidisciplinary case study. Measure 1: Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. I be a component.) Measure 1: Measure 1: Measure 1: No curricular or pedagogical changes needed at this time this time Measure 1: Measure 1: No curricular or pedagogical changes needed at this time Measure 1: Measur	*						
and processing, analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Measure 1: Students will accurately correlate laboratory theory and utilize the terminology to solve multidisciplinary case studies. Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. Learning Outcome 5: Gather additional laboratory data and Measure 1: Students will solve the multidisciplinary case studies by applying knowledge of laboratory theory and terminology with 100% accuracy. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Measure 1: Students solved the multidisciplinary and terminology to the practical laboratory work presented in the multidisciplinary case study. Measure 1: Mea	1 .	_					
analysis, interpretation, and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology work Measure 1: Students will solve the practical laboratory work Measure 1: Students will solve the multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Iberaring Outcome 5: Gather additional laboratory data and in groups to solve in groups to correctly identify Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Students solved the multidisciplinary case studies with 100% accuracy. Measure 1: Students solved the multidisciplinary case study. Measure 1: Measure 1: Measure 1: Measure 1: Measure 1: Measure 1: Students solved the multidisciplinary case study. Measure 1: Measur	-						
and use of quality assurance procedures. Learning Outcome 4: Correlate laboratory theory and terminology work work Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work Learning Outcome 5: Cather additional aboratory data and use of quality assurance procedures. Measure 1: Measure 1: Students will solve the multidisciplinary case studies by terminology to solve multidisciplinary case studies. Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. In the practical laboratory theory and terminology to solve multidisciplinary case studies. Measure 1: Measure 1: Students will solve the multidisciplinary case studies with 100% accuracy. In the practical laboratory theory and terminology to the practical laboratory work presented in the multidisciplinary case study. Measure 1:							
Learning Outcome 4: Correlate laboratory theory and terminology work Students will aboratory theory and utilize the terminology to solve multidisciplinary case studies. Measure 1:							
Correlate laboratory theory and terminology to practical laboratory work Mork Students will accurately correlate laboratory theory and utilize the terminology to solve multidisciplinary case studies by applying knowledge of multidisciplinary case studies. Measure 1: Gather additional laboratory data and Students will solve the multidisciplinary case studies solved the multidisciplinary case studies with 100% accuracy. Students solved the multidisciplinary case studies with 100% accuracy. In multidisciplinary case studies with 100% accuracy. Students solved the multidisciplinary case studies with 100% accuracy. In proper students solved the multidisciplinary case studies with 100% accuracy. Students solved the multidisciplinary case studies with 100% accuracy. In proper students solved the multidisciplinary case study. Students solved the multidisciplinary case study. Measure 1: Students will solve multidisciplinary successfully Students solved the multidisciplinary students solved the multidisciplinary successfully	<u> </u>						
theory and terminology to practical laboratory work work and utilize the terminology to solve multidisciplinary case studies by and terminology to solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and in groups to practical laboratory theory and utilize the terminology to solve multidisciplinary case studies by applying knowledge of laboratory theory and terminology with 100% accuracy. Measure 1: Students will work laboratory data and Measure 1: Students will work in groups to Measure 1: Students will case studies with 100% accuracy. Measure 1: Measure 1: Students will case studies with 100% accuracy. Measure 1: Students will case studies with 100% accuracy. Measure 1: Students will work in groups to Measure 1: Students will case studies with 100% accuracy. Measure 1: Students will students will case studies with 100% accuracy. Measure 1: Students will students will students solved the multidisciplinary successfully Measure 1: No curricular or pedagogical							
to practical laboratory work aboratory theory and utilize the terminology to solve multidisciplinary case studies by and terminology to solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and laboratory theory and terminology to solve multidisciplinary case studies by applying and terminology to the practical laboratory theory and terminology with 100% accuracy. Learning Outcome 5: Students will work laboratory data and In groups to In groups t	-						
work and utilize the terminology to solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and utilize the terminology to solve multidisciplinary case studies. And utilize the terminology applying applying and terminology to the practical laboratory work presented in the multidisciplinary case study. Measure 1: Measure 1: Students will work in groups to Measure 1: Measure 1: Students solved the multidisciplinary successfully Measure 1: Measur		_			_		
terminology to solve knowledge of multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and letrminology to knowledge of multidisciplinary case studies. Applying knowledge of the practical laboratory work presented in the multidisciplinary case study. Measure 1: Measure 1: Measure 1: Measure 1: All Measure 1: No Students will work in groups to correctly identify multidisciplinary successfully pedagogical							
solve multidisciplinary case studies. Learning Outcome 5: Gather additional laboratory data and laboratory data and laboratory data and solve multidisciplinary laboratory theory and terminology with 100% and terminology with 100% accuracy. Measure 1: Students will work in groups to Measure 1:	WOLK			100% accuracy.	-	unis ume	
multidisciplinary case studies. Iaboratory theory and terminology with 100% accuracy. Learning Outcome 5: Gather additional laboratory data and multidisciplinary accuracy laboratory data and laboratory data and laboratory theory and terminology with 100% accuracy. Measure 1: Measure 1: Measure 1: Measure 1: Students will work in groups to correctly identify multidisciplinary successfully pedagogical			1100				
case studies. and terminology with 100% accuracy. Learning Outcome 5: Gather additional laboratory data and laboratory data							
with 100% accuracy. Learning Outcome 5: Measure 1: Measure 1: Measure 1: Measure 1: No Gather additional laboratory data and in groups to with 100% accuracy. Measure 1: Measure 1: Measure 1: All students solved the in groups to correctly identify multidisciplinary successfully pedagogical							
Learning Outcome 5:Measure 1:Measure 1:Measure 1:Measure 1:Measure 1:Measure 1:Measure 1:Measure 1:NoGather additional laboratory data andStudents will work in groups toStudents will correctly identifyStudents solved the multidisciplinarystudents successfullycurricular or pedagogical			23		-		
Gather additional laboratory data and Students will work in groups to Students will Students solved the laboratory data and Students will students solved the multidisciplinary successfully pedagogical			accuracy.				
laboratory data and in groups to correctly identify multidisciplinary successfully pedagogical	\mathbf{c}						
apply problem-solving brainstorm additional case studies with identified changes needed at	-						
skills to solve additional laboratory data 100% accuracy. additional this time				100% accuracy.		tnis time	
problems/discrepancies. laboratory data required to correctly solve the laboratory data required and	problems/discrepancies.	_					
correctly solve the multidisciplinary demonstrated		_					
correctly solve the inditidisciplinary definitions and constrained problem solving		correctly solve the	<u> </u>				

	Evic	dence of Learning: Co	urses within the Major	•	
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures* multidisciplinary case studies.			skills necessary to resolve the multidisciplinary case studies.	
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: Students relate laboratory findings to common diseases in the multidisciplinary case study and simulated interprofessional education (IPE) activity.	Measure 1: Students will relate laboratory findings to the disease states presented in the case study and IPE activity with 100% accuracy.	Measure 1: 100% of students were able to relate laboratory findings to common diseases.	Measure 1: All students correctly related laboratory findings to common diseases.	Measure 1: No clinical changes needed at this time
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance, punctuality, and professional/ethical expectations defined in course syllabus	Measure 1: Students will attend regular course offerings, be punctual, and demonstrate professional/ ethical behavior while interacting with fellow students.	Measure 1: Students attended regular course offerings with >90% attendance and punctuality. No issues related to unprofessional behavior/ lack of ethics were noted during lectures, group work, and/or IPE activities.	Measure 1: All students attended the sessions with >90% attendance and most were punctual	Measure 1: No curricular or pedagogical changes needed at this time

	Evidence of Learning: Courses within the Major							
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**			
Students will	Direct and Indirect Measures*	2000000						
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the laboratory	Measure 1: Students demonstrate effective communication skills and behaviors while they interview a member from a different allied healthcare program.	Measure 1: All students will demonstrate effective communication skills while conducting the interview.	Measure 1: 100% of students were able to communicate effectively and professionally during the interview.	Measure 1: All students were able to demonstrate effective communication skills and behaviors with their colleagues within the program.	Measure 1: No curricular or pedagogical changes needed at this time			
	Measure 2: Students demonstrate effective communication skills and behaviors while they work in teams to solve case studies and participate in a simulated IPE activity.	Measure 2: All students will demonstrate effective communication skills while working on the case studies and within their role in the simulated IPE activity.	Measure 2: 100% of students demonstrated effective communication skills while working in groups on the case studies and within their role in the simulated IPE activity.	Measure 2: All students were able to demonstrate effective communication skills and behaviors with their colleagues within the program.	Measure 2: No changes needed at this time			

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 4410 is a course covering the theory and principles of interdisciplinary teamwork within the healthcare setting. This course provides an interdisciplinary experience with the team concept as a priority. Students learn the roles and responsibilities of various healthcare professionals. The course teaches students to practice an interdisciplinary approach as they research, interact, and learn in the interdisciplinary environment of a healthcare setting. MLS 4410 contains seven of the program's identified learning goals, though in appropriately varying amounts. As noted in the curriculum map, learning 1, 2, and 4 are utilized, 5 and 6 are emphasized, and 7 and 8 are comprehensively assessed. Learning goal 3 is not applicable to this course. In all cases, the measures show that 100% of the students are reaching all 7 goals at levels of 80% or above, so no curricular or clinical changes are seen as needed at this time. Data in this table are derived from five sections of the course taught in spring 2019 by Justin Rhees. Prior to spring, 2019, MLS 4410 was taught by Janet Oja.

Evidence of Learning: Courses within the Major: MLS 4803 Research Projects in MLS

	Evidence of Learning: Courses within the Major							
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**			
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: Student research groups develop a research question / hypothesis related to MLS and write a grant detailing the experimentation needed to test their hypothesis.	Measure 1: 100% of student groups will develop a research question relating to MLS and also develop methods to address the research question	Measure 1: 100% of student groups developed a research question relating to MLS and also developed methods to address the research question	Measure 1: All students were able to define a clear hypothesis and outline a research proposal for the next year detailing their experimental approaches and expected results.	Measure 1: No curricular or pedagogical changes needed at this time; however we are always critiquing the grants produced by the students to improve the likelihood of obtaining funding.			
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Student groups identify appropriate statistical calculations to be used in analyzing data to be collected.	Measure 1: 100% of student groups will identify appropriate statistical calculations to be used in analyzing data to be collected.	Measure 1: 100% of student groups identified appropriate statistical calculations to be used in analyzing data to be collected.	Measure 1: The students have achieved the learning outcome by defining the statistical calculations they intend to use.	Measure 1: No curricular or pedagogical changes needed at this time			
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation,	Goal not applicable to research class this semester because it is focuses on generating a hypothesis, writing a research grant, and obtaining	NA	NA	NA	NA			

	Evi	idence of Learning: Co	urses within the Major	•	
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*				
and use of quality assurance procedures.	funding for experimentation in the following semester.				
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: During the process of developing the research methods, students will correlate laboratory theory and terminology to determine what testing is required to test their hypothesis	Measure 1: 100% of students will correlate laboratory theory and terminology to determine the appropriate tests/methodologies required to experimentally test their hypothesis.	Measure 1: 100% of students correlated laboratory theory and terminology to determine the appropriate experimental methodologies to use in their research plan.	Measure 1: The students were able draw on their knowledge of the clinical laboratory and describe detailed methods to test their hypothesis.	Measure 1: No curricular or pedagogical changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	Goal not applicable to this research-based course	NA	NA	NA	NA
Learning Outcome 6: Relate laboratory findings to common disease.	Goal not applicable to this research-based course	NA	NA	NA	NA

Evidence of Learning: Courses within the Major							
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
Students will	Direct and Indirect Measures*						
Learning Outcome 7: Demonstrate professional conduct and ethical behavior	Measure 1: Attendance and punctuality expectations defined in course syllabus	Measure 1: 100% of students will attend class and be punctual.	Measure 1: 95% attendance in class	Measure 1: Most students attended class each week, a few had excuses absences	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Obtain CITI certification in Institutional Review Board (IRB) training	Measure 2: 100% of students will achieve at least an 80% on the seven CITI training modules for IRB certification	Measure 2: 100% of students achieved CITI IRB certification	Measure 2: All students were able to pass the seven training modules and earn the CITI certification	Measure 2: No clinical changes needed at this time		
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the laboratory	Measure 1: 7 course group assignments demonstrating writing proficiency (e.g. abstract, grant proposal, methods, budget sheet)	Measure 1: 100% of student groups will demonstrate writing proficiency with scores above 80% or better by following directions and format (e.g. abstract and grant guidelines)	Measure 1: 100% of students scored better than 80% on written group assignments	Measure 1: All student groups were able to demonstrate writing proficiency and that they could adequately communicate their hypothesis, methodological approach, and budget justifications	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: demonstrates effective communication and collaboration within	Measure 2: 100 % of students will demonstrate effective communication and	Measure 2: 93% of students demonstrated effective communication and	Measure 2: Most students were able to effectively communicate in a collaborative	Measure 2: No curricular or pedagogical changes needed at this time		

	Evidence of Learning: Courses within the Major								
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of				
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**				
		Learning							
Students will	Direct and Indirect								
	Measures*								
	research group and	collaboration within	collaboration within	fashion within their					
	with research	research group and	research group and	research group and					
	mentor	with research	with research	with mentor; one					
		mentor	mentor	student did have an					
				unresolvable					
				conflict with their					
				group and needed to					
				be removed from					
				the project.					

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 4803 – Research Projects in MLS is the first in a series of two courses that span over a single academic year. These data presented are from the most recent campus semester taught, Fall 2018. Students in this course will be guided by the instructor/research mentor through developing a hypothesis, obtaining grant support, experimentation, analysis, and dissemination of their research over an entire year. The first course focuses on developing an independent research question, hypothesis/es that can potentially answer this question, and specific aims to test their hypothesis/es. Over the course of the first semester, students write an abstract, a 7-8 page research proposal outlining their research plan for the coming year, obtain CITI certified IRB training, and apply for project and travel funding for the Spring semester.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 4804 Research Projects in MLS II

	Evidence of Learning: Courses within the Major						
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
Students will	Direct and Indirect	Student Learning	5	8			
	Measures*						
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: Student groups will perform experimentation outlined in the Fall proposals to test their main hypothesis/es	Measure 1: 100% of student groups will conduct experimental objectives to successfully test their main hypothesis/es by the March	Measure 1: 100% of student groups were able to complete their experimental goals by the March presentation & dissemination deadline	Measure 1: All the student groups were able to optimize and perform the myriad of experimental methods outlined in their research proposals	Measure 1: No changes are required, but even with success every group meets challenges or obstacles to performing their experiments that		
		presentation & dissemination deadline			must be problem- solved in the time allotted		
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Student groups will perform various laboratory mathematical calculations to setup and carry out their experiments (e.g. buffers, reagents, standard curves, etc.)	Measure 1: 100% of student groups will successfully perform the calculations required to achieve their research objectives	Measure 1: 100% of student groups were able to perform the various calculations required to perform their experiments (e.g. make buffers, reagents, standard curves, etc.)	Measure 1: All groups were able to perform the appropriate set of calculations to setup, perform, and analyze their experiments	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Statistical analysis will be applied to data collected for	Measure 2: 100% of student groups will be able to apply the	Measure 2: 100% of student groups were able to apply formal statistical	Measure 2: Each student group was able to apply a unique set of	Measure 2: No curricular or pedagogical		

	Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of		
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**		
		Student Learning					
Students will	Direct and Indirect						
	Measures*		4				
	hypothesis testing	appropriate	tests to asses and	statistical tests	changes needed at this time		
	(e.g. t-tests, ANOVA, linear	statistical test to formally assess	analyze their	appropriate for	this time		
	regression, etc.)	their data and test	experimental data	their project data and hypothesis/es			
	regression, etc.)	their hypothesis/es		and hypothesis/es			
		then hypothesis/es					
Learning Outcome 3:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: 100%	Measure 1: No		
Perform laboratory	Preform laboratory	of laboratory	of laboratory	of student groups	curricular or		
procedures from simple	testing of identified	testing will be	testing was	were able to	pedagogical		
to complex, including	research methods to	completed for the	completed for the	complete	changes needed at		
specimen collection	address research	identified research	identified research	laboratory testing	this time		
and processing,	question, if	methods to address	methods to address	for the identified			
analysis, interpretation,	appropriate for	the identified research methods to	the identified research methods to	research methods			
and use of quality assurance procedures.	research project	test hypothesis/es	test hypothesis/es	to test hypothesis/es			
Learning Outcome 4:	This outcome is not	NA	NA	NA	NA		
Correlate laboratory	applicable to this	IVA	IVA	IVA	IVA		
theory and terminology	research-based						
to practical laboratory	course.						
work							
Learning Outcome 5:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: Every	Measure 1: No		
Gather additional	Students will	of students will	of students were	research group	curricular or		
laboratory data and	evaluate each set of	evaluate each set of	able to evaluate	encountered	pedagogical		
apply problem solving	experimental	experimental	each set of	obstacles or errors	changes needed at		
skills to solve	results and modify	results and modify	experimental	that required	this time		
problems/discrepancies.	methods/procedures	methods/procedures	results and modify	troubleshooting or			
	to ensure successful	to ensure successful	methods/procedures	optimizing their			
	experimentation	experimentation	to ensure successful	protocols			
			experimentation				

	Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of	
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**	
		Student Learning				
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 6:	Measure 1: If	Measure 1: 100%	Measure 1: 100%	Measure 1: When	Measure 1: No	
Relate laboratory	appropriate to	of students will	of students related	applicable, the	curricular or	
findings to common	research question or	relate research	research findings to	students were able	pedagogical	
disease.	hypothesis,	findings to	common disease, if	to relate the data	changes needed at	
	students will relate	common disease, if	appropriate for	they collected to	this time	
	research findings to	appropriate for	research project	specific disease		
	common disease	research project		states		
Learning Outcome 7:	Measure 1:	Measure 1:100% of	Measure 1: 100%	Measure 1:	Measure 1: No	
Demonstrate	Attendance and	students will attend	of the student	Perform, analyzing,	curricular or	
professional conduct	punctuality	class and lab	groups attended the	and disseminating	pedagogical	
and ethical behavior	expectations	sections to	designated class	their research in	changes needed at	
	defined in course	complete their	and lab sections, as	one semester is a	this time	
	syllabus and	experiments on	well as complete	challenge, having		
	research contract	time	their	the students stick to		
	between students		experimentation on	a schedule helps		
			time	ensure completion.		
	Measure 2: Present	Measure 2: 100%	Measure 2: 100%	Measure 2: All of	Measure 2: No	
	their research to	of the student	of the student	the research groups	curricular or	
	professionals at	groups will submit	groups were able to	presented their	pedagogical	
	various local and	abstracts and be	submit abstracts	posters at a	changes needed at	
	national	accepted for a	and be accepted for	University research	this time	
	conferences	poster presentation	a poster	symposium and a		
			presentation	local medical		
				society meeting,		
				along with select		
				groups presenting		
				at one of two		
				national		

	Evic	dence of Learning: Cor	urses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of	Learning Outcomes	Findings	Results**
		Student Learning			
Students will	Direct and Indirect				
	Measures*				
				professional	
				meetings	
Learning Outcome 8:	Measure 1: 3	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	course group	of student groups	of students scored	student groups	curricular or
communication skills	assignments	will demonstrate	better than 80% on	were able to	pedagogical
and behaviors with	demonstrating	writing proficiency	written group	demonstrate	changes needed at
colleagues in the	writing proficiency	on 3 assignments	assignments	writing proficiency	this time
program and in the		with scores above		on groups	
laboratory		80% or better		assignments	
	Measure 2:	Measure 2: 100 %	Measure 2: 93% of	Measure 2: Most	Measure 2: No
	Demonstration of	of students will	students	students were able	curricular or
	effective	demonstrate	demonstrated	to effectively	pedagogical
	communication and	effective	effective	communicate in a	changes needed at
	collaboration	communication and	communication and	collaborative	this time
	within research	collaboration	collaboration	fashion within their	
	group and with	within research	within research	research group and	
	research mentor	group and with	group and with	with mentor	
		research mentor	research mentor		

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 4804 – Research Projects in MLS II. This course is a continuation of MLS 4803. Students will continue working on their original research project that was outlined in the Fall semester. After completing the project, students will present their research findings in poster and oral formats, along with preparing a formal manuscript for publication in the university undergraduate research journal ERGO and possibly in other appropriate scientific journals. The data presented are from the most recent completed semester Spring 2019.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Evidence of Learning: Courses within the Major: MLS 4411 Simulated Laboratory I

	Evidence of Learning: MLS 4411					
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**	
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical, interpretive, and problem solving skills.	Measure 1: Participation in Simulated Lab Sessions	Measure 1: 100% of students will participate in simulated lab sessions and apply knowledge learned in the MLT program	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: Recognition of critical values	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time	
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: Students will calculate CBC values from an EDTA clumper patient.	Measure 1: Students rotating through Hematology will calculate CBC values from an EDTA clumper patient.	Measure 1: 100% of Students rotating through Hematology will calculate CBC values from an EDTA clumper patient.	Measure 1: All students rotating through Hematology will calculate CBC values from an EDTA clumper patient.	Measure 1: No curricular or pedagogical changes needed at this time	
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No clinical changes needed at this time	
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection	Measure 1: Rotation through all departments of SIM lab	Measure 1: Students will rotate through each department: Processing, UA,	Measure 1: 100% of students will rotate through each department: Processing, UA,	Measure 1: 100% of students rotated through each department: Processing, UA,	Measure 1: No curricular or pedagogical changes needed at this time	

	Evidence of Learning: MLS 4411						
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**		
and processing, analysis, interpretation, and use of quality assurance procedures.		serology, heme, Coag, Chem, blood bank and micro at least one week during the semester. Measure 2:	serology, heme, Coag, Chem, blood bank and micro at least one week during the semester. Measure 2: 100%	serology, heme, Coag, Chem, blood bank and micro at least one week during the semester. Measure 2: 90%	Measure 2: No		
	Measure 2: Weekly sample collection	Measure 2: Students will draw blood each week for a total of 12 blood draws.	of students will draw blood each week for a total of 12 blood draws.	drew blood each week.	clinical changes needed at this time		
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students participate in mock CAP inspection	Measure 1: All students will review current CAP standards and prepare a laboratory for inspection	Measure 1: 100% of students participated in mock CAP inspection and submitted a deficiency report to lab manager	Measure 1: All students successfully participated in mock CAP inspection	Measure 1: No curricular or pedagogical changes needed at this time		
	Measure 2: Students will calibrate laboratory equipment	Measure 2: All students will calibrate laboratory equipment currently in use	Measure 2: 100% of students calibrated laboratory equipment to lab manager standards	Measure 2: All students successfully participated in calibration studies	Measure 2: No clinical changes needed at this time		
Learning Outcome 5: Gather additional laboratory data and apply problem solving	Measure 1: Students will dilute a critical glucose value	Measure 1: Students rotating through chemistry	Measure 1: 100% of students rotating through chemistry	Measure 1: All students rotating through chemistry successfully diluted	Measure 1: No curricular or pedagogical		

		Evidence of Learn	ing: MLS 4411		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect	Learning			
Students will	Measures*				
skills to solve	Wiedsures	will dilute a critical	diluted a critical	a critical glucose	changes needed at
problems/discrepancies.		glucose value	glucose value	value	this time
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: NA
Learning Outcome 6:	Measure 1:	Measure 1:	Measure 1: 100%	Measure 1: 100% of	Measure 1: No
Relate laboratory	Participation in	Students will	of Students will	participated in a	curricular or
findings to common disease.	blood bank SBAR exercise.	participate in a blood bank exercise	participate in a blood bank exercise	blood bank exercise	pedagogical
disease.	exercise.	using the SBAR	using the SBAR	using the SBAR technique for which	changes needed at this time
		technique for which	technique for which	they will relate	tills tillic
		they will relate	they will relate	laboratory findings	
		laboratory findings to disease	laboratory findings to disease	to disease	
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 7:	Measure 1:	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate	Affective domain	students will be	of students will be	students assessed	curricular or
professional conduct	rubric assessment	assessed using the	assessed using the	using the affective	pedagogical
and ethical behavior	of timeliness and	affective domain	affective domain	domain rubric and	changes needed at
	professionalism	rubric and receive	rubric and receive	received the higher	this time
		the higher	the higher	acceptable mark.	
		acceptable mark.	acceptable mark.		

		Evidence of Learn	ing: MLS 4411		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student	Learning Outcomes	Findings	Results**
		Learning			
Students will	Direct and Indirect				
	Measures*				
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: 100% of	Measure 2: No
	Assessment of	students will be	of students will	students	clinical changes
	Telephone skills	assessed in proper	demonstrate proper	demonstrated	needed at this time
		telephone skills.	telephone skills.	proper telephone	
				skills.	
Learning Outcome 8:	Measure 1: Student	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	functioning as a	students will	of students	students	curricular or
communication skills	member of a team	participate in team	participated in team	participated in and	pedagogical
and behaviors with		projects, each	projects, with each	managed the team	changes needed at
colleagues in the		taking turns being	taking a turn as	for all projects	this time
program and in the		the project manager	project manager		
laboratory	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No
	Evaluation and	student managers	of student managers	students completed	curricular or
	participation in	will report on team	will report on team	evaluations on team	pedagogical
	simulated lab	members skills and	members skills and	members on team	changes needed at
	sessions through	participation in	participation in	members skills and	this time
	completion of a	simulated lab	simulated lab	participation in	
	manager's checklist	sessions.	sessions.	simulated lab	
	in SIM lab.			sessions	

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary: MLS 4411 – MLS Simulated Laboratory I. This course teaches is a hands-on simulated working laboratory in which students refine technical skills, problem identification and solving, work-load management, and decision-making skills, development of strategies for managing and implementing the rules and regulations that govern medical laboratory testing. Data in this table are derived from five semesters taught fall 2014-2018 by Janet Oja and Janice Thomas

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

	Evidenc	ce of Learning: MLS 44	112 Simulated Laborate	ory II	
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical,	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
interpretive, and problem solving skills.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1N/A	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time

	Evidenc	e of Learning: MLS 44	12 Simulated Laborate		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students participate in mock CAP inspection	Measure 1: All students will review current CAP standards and prepare a laboratory for inspection	Measure 1: 100% of students participated in mock CAP inspection and submitted a deficiency report to lab manager	Measure 1: All students successfully participated in mock CAP inspection	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: Students will calibrate laboratory equipment	Measure 2: All students will calibrate laboratory equipment currently in use	Measure 2: 100% of students calibrated laboratory equipment to lab manager standards	Measure 2: All students successfully participated in calibration studies	Measure 2: No clinical changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
problems/discrepancies.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time

	Evidenc	e of Learning: MLS 44	112 Simulated Laborate	ory II	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal Students will	Measurement Direct and Indirect	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Measures*				
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 7:	Measure 1: Student	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate	participation in	students will	of students	students	curricular or
professional conduct	customer service	participate and	participated in	participated and	pedagogical
and ethical behavior	and emotional	develop written	customer service	developed written	changes needed at
	intelligence project	responses to	and emotional	responses to	this time
		customer service	intelligence case	customer service	
		case studies	studies	case studies	
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No
					clinical changes
					needed at this time
Learning Outcome 8:	Measure 1: Student	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	functioning as a	students will	of students	students	curricular or
communication skills	member of a team	participate in team	participated in team	participated in and	pedagogical
and behaviors with		projects, each	projects, with each	managed the team	changes needed at
colleagues in the		taking turns being	taking a turn as	for all projects	this time
program and in the		the project manager	project manager		
laboratory	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No
	Evaluation of each	students will	of students	students completed	curricular or
	team member for	complete	completed	evaluations on team	pedagogical
	effective	evaluations on team	evaluations on team	members for	changes needed at
	communication	members for	members for	effective	this time
	skills and	effective	effective	communication	
	participation in	communication	communication	skills and	
	projects	skills and	skills and	participation in	
		participation in	participation in	group projects	
		group projects	group projects		

- *At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.
- ** MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 4412 – MLS Simulated Laboratory II. This course teaches fundamental principles for establishing a simulated working laboratory in which students refine technical skills, problem identification and solving, work-load management, and decision-making skills, development of strategies for managing and implementing the rules and regulations that govern medical laboratory testing. MLS 4411 contains 3 of the program's identified learning goals. Data in this table are derived from 2014-2018 taught by Janet Oja and Janice Thomas.

Evidence of Learning: Courses within the Major: MLS 4412 Simulated Laboratory II

		Evidence of Learn	ing: MLS 4412		
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Learning Outcome 1: Demonstrate knowledge of theory underlying laboratory testing using analytical,	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
interpretive, and problem solving skills.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 2: Apply mathematical calculations to laboratory situations.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1N/A	Measure 1: No curricular or pedagogical changes needed at this time
and processing, analysis, interpretation, and use of quality assurance procedures.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time

		Evidence of Learn	ing: MLS 4412		
Measurable Learning Goal Students will	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students participate in mock CAP inspection	Measure 1: All students will review current CAP standards and prepare a laboratory for inspection	Measure 1: 100% of students participated in mock CAP inspection and submitted a deficiency report to lab manager	Measure 1: All students successfully participated in mock CAP inspection	Measure 1: No curricular or pedagogical changes needed at this time
	Measure 2: Students will calibrate laboratory equipment	Measure 2: All students will calibrate laboratory equipment currently in use	Measure 2: 100% of students calibrated laboratory equipment to lab manager standards	Measure 2: All students successfully participated in calibration studies	Measure 2: No clinical changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time
problems/discrepancies.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No curricular or pedagogical changes needed at this time

Evidence of Learning: MLS 4412					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of
Goal	Measurement	Evidence of Student Learning	Learning Outcomes	Findings	Results**
Students will	Direct and Indirect Measures*				
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No clinical changes needed at this time
Learning Outcome 7:	Measure 1: Student	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate	participation in	students will	of students	students	curricular or
professional conduct	customer service	participate and	participated in	participated and	pedagogical
and ethical behavior	and emotional	develop written	customer service	developed written	changes needed at
	intelligence project	responses to	and emotional	responses to	this time
		customer service	intelligence case	customer service	
		case studies	studies	case studies	
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No
					clinical changes
					needed at this time
Learning Outcome 8:	Measure 1: Student	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate effective	functioning as a	students will	of students	students	curricular or
communication skills	member of a team	participate in team	participated in team	participated in and	pedagogical
and behaviors with		projects, each	projects, with each	managed the team	changes needed at
colleagues in the		taking turns being	taking a turn as	for all projects	this time
program and in the		the project manager	project manager		
laboratory	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No
	Evaluation of each	students will	of students	students completed	curricular or
	team member for	complete	completed	evaluations on team	pedagogical
	effective	evaluations on team	evaluations on team	members for	changes needed at
	communication	members for	members for	effective	this time
	skills and	effective	effective	communication	
	participation in	communication	communication	skills and	
	projects	skills and	skills and	participation in	
		participation in	participation in	group projects	
		group projects	group projects		

- *At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.
- ** MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

Summary: MLS 4412 – MLS Simulated Laboratory II. This course is a continuation of MLS 4411. Students staff a simulated medical laboratory and assume responsibilities associated with all facets of laboratory operations. Clinical and academic faculty serves as advisors/managers to each team of students. The process develops team building skills critical to the modern health care setting. MLS 4412 expands to examine issues that cross all health care disciplines. MLS 4412 contains 3 of the program's identified learning goals. As noted in the curriculum map, learning goals 4, 7, and 8 are utilized in this course. Data in this table are derived from five semesters taught fall 2014-2018 by Janet Oja and Janice Thomas.

Evidence of Learning: Courses within the Major: MLS 4415 Laboratory Teaching and Supervision

Evidence of Learning: Courses within the Major: MLS 4415					
Measurable Learning	Method of	Threshold for	Findings Linked	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	to Learning	Findings	of Results**
a. 1	D 1	Student Learning	Outcomes		
Students will	Direct and				
	Indirect Measures*				
Learning Outcome 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Demonstrate knowledge	Multiple choice	Students are	The majority of	Students have	No changes
of theory underlying	questions in	expected to score	students were	proved to have	needed at this
laboratory testing using	Management	80% or better to	able to achieve	knowledge of	time
analytical, interpretive,	theory Quiz	prove knowledge	80% or higher	management	
and problem solving		and competency	competency	theories	
skills.					
	NY / A	NT / A	NT / A	NT / A	NY / A
Learning Outcome 2:	N/A	N/A	N/A	N/A	N/A
Apply mathematical calculations to					
laboratory situations.					
Learning Outcome 3:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Perform laboratory	Students are	All students will	All students	All students	No changes
procedures from simple	assigned to TA a	achieve 90% or	participated as	successfully	needed at this
to complex, including	laboratory where	better attendance	TAs and achieved	demonstrated	time
specimen collection and	they can apply	to their assigned	90% or better	their proficiency	
processing, analysis,	previously	labs. Lab	attendance.	in education and	
interpretation, and use	learned	instructors evaluate their		training by	
of quality assurance procedures.	procedures in education and	performance		assisting in laboratory	
procedures	training and	using a rubric.		teaching.	
	quality assurance.			· · · · · · · · · · · · · · · · · · ·	

Evidence of Learning: Courses within the Major: MLS 4415					
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*				
Learning Outcome 4: Correlate laboratory theory and terminology to practical laboratory work	Measure 1: Students participate in online discussions analyzing management case studies scenarios and applying the management concepts previously learned.	Measure 1: The majority of students will participate and score 80% or better on all discussions.	Measure 1: The majority of students participated and scored 80% or better on all online discussions.	Measure 1: Students were able to correlate management theory to real life case study situations and management scenarios.	Measure 1: No changes needed at this time
Learning Outcome 5: Gather additional laboratory data and apply problem solving skills to solve problems/discrepancies.	N/A	N/A	N/A	N/A	N/A
Learning Outcome 6: Relate laboratory findings to common disease.	N/A	N/A	N/A	N/A	N/A
Learning Outcome 7:	Measure 1: Attendance and punctuality	Measure 1: Students will attend class	Measure 1: The majority of students attended	Measure 1: Students attended class sessions and	Measure 1:

Evidence of Learning: Courses within the Major: MLS 4415					
Measurable Learning Goal	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results**
Students will	Direct and Indirect Measures*				
Demonstrate professional conduct and ethical behavior	expectations defined in course syllabus.	section and be punctual.	class sessions unless previously excused	most were punctual. They demonstrated professional conduct and ethical behavior.	No changes needed at this time
	Measure 2: Students will listen to a guest speaker on resume writing and critique each other's resumes.	Measure 2: Students will attend and participate in a resume critique exercise where they will review 3 of their classmates' resumes.	Measure 2: The majority of students attended and participated in a resume critique exercise where they reviewed 3 of their classmates' resumes.	Measure 2: Students attended and participated in a resume critique exercise. They demonstrated professional conduct and ethical behavior.	Measure 2: No changes needed at this time
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the laboratory	Measure 1: Students will listen to a guest speaker on interviewing skills and participate in mock interviews.	Measure 1: Students will participate as interviewer and interviewee in mock interview exercise and score 80% or higher in peer evaluations.	Measure 1: The majority of participated in the mock interviews and scored 80% or higher in their peer evaluations	Measure 1: Students were able to apply interviewing skills previously learned in class through class lectures and guest speakers	Measure 1: No changes needed at this time

	Evidence of Learning: Courses within the Major: MLS 4415				
Measurable Learning	Method of	Threshold for	Findings Linked	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	to Learning	Findings	of Results**
G. 1		Student Learning	Outcomes		
Students will	Direct and				
	Indirect				
	Measures*				
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:
	Students	The majority of	The majority of	Students were	No changes
	participate in	students will	students	able to correlate	needed at this
	online discussions analyzing	participate and score 80% or	participated and scored 80% or	management theory to real life	time
	management case	better on all	better on all	case study	
	studies scenarios	discussions.	online	situations and	
	and applying the	uiscussioiis.	discussions.	management	
	management		discussions.	scenarios.	
	concepts			Section 103.	
	previously				
	learned.				

MLS 4415: Students will apply sound instructional and pedagogical theory. Approaches to management, leadership of groups, human resource management, and technical supervision will also be covered and reinforced through online discussions and case study analysis. Each student will also participate as a laboratory teaching assistant (TA) in a MLS laboratory section assisting the faculty in the administration of the laboratory instruction. Each student will be assigned to a MLS course laboratory section in which expected behavior includes: active participation in laboratory teaching, demonstration of procedures, preparation of laboratory teaching materials and assisting laboratory faculty and students where ever needed. Data based on 5 semesters taught by Janice Thomas 2014-18.

^{*}At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

^{**} MLS department policy states that not achieving a minimum competency of 80% overall will result in a letter grade of C. A grade below B-is not considered passing for students wishing to complete the MLS (MT) program.

106 Report due 11/15/2019

Appendix A

Most departments or programs receive a number of recommendations from their Five/Seven-Year Program Review processes. This page provides a means of updating progress towards the recommendations the department/program is acting upon.

Additional narrative:

See NAACLS_Five_Year_Interim_Report_2019 that has been included with this submission. Our two degree programs recently went through and were approved for a five-year interim review of our 10 year accreditation. We received the 10-year accreditation October 31st, 2015 with a planned 10-year review to begin in the academic year 2024-25.

Appendix B

Please provide the following information about the full-time and adjunct faculty contracted by your department during the last academic year (summer through spring). Gathering this information each year will help with the headcount reporting that must be done for the final Five Year Program Review document that is shared with the State Board of Regents.

Faculty Headcount	2017-28	2018-19
With Doctoral Degrees (Including MFA and other terminal degrees, as specified by the institution)		
Full-time Tenured	1	2
Full-time Non-Tenured (includes tenure-track)	1	1
Part-time and adjunct	-	-
With Master's Degrees		
Full-time Tenured	1	0
Full-time Non-Tenured	3	3
Part-time and adjunct	3	2
With Bachelor's Degrees		
Full-time Tenured	2	2
Full-time Non-tenured	4	4
Part-time and adjunct	5	4
Other		
Full-time Tenured	-	-
Full-time Non-tenured	-	-
Part-time	-	-
Total Headcount Faculty		
Full-time Tenured	2	2
Full-time Non-tenured	4	4
Part-time	5	4

Appendix C – alternative format for Evidence of Learning Reporting

Course:

Program Outcome 1	
Aligned Course Outcome(s):	
Method(s) of measurement:	
Target Performance:	
Actual Performance:	
Interpretation/Reflection on findings:	
Action Plan/Use of Results:	
Intended evaluation of plan (closing the loop):	

Please respond to the following questions.

- 1) First year student success is critical to WSU's retention and graduation efforts. We are interested in finding out how departments support their first-year students. Do you have mechanisms and processes in place to identify, meet with, and support first-year students? Please provide a brief narrative focusing on your program's support of new students:
 - a. Any first-year students taking courses in your program(s).

 No, we only accept students usually in their Junior years at the earliest. We do provide college level advising for students interested in health professions.

b. Students declared in your program(s), whether or not they are taking courses in your program(s) We do provide college level advising for students interested in health professions.

2) A key component of sound assessment practice is the process of 'closing the loop' – that is, following up on changes implemented as a response to your assessment findings, to determine the impact of those changes/innovations. It is also an aspect of assessment on which we need to improve, as suggested in our NWCCU mid-cycle report. Please describe the processes your program has in place to 'close the loop'.

See attached five-year interim NAACLS accreditation report. We consistently perform continuous quality improvement with our courses and programs.

Glossary

Student Learning Outcomes/Measurable Learning Outcomes

The terms 'learning outcome', 'learning objective', 'learning competency', and 'learning goal' are often used interchangeably. Broadly, these terms reference what we want students to be able to do AFTER they pass a course or graduate from a program. For this document, we will use the word 'outcomes'. Good learning outcomes are specific (but not too specific), are observable, and are clear. Good learning outcomes focus on skills: knowledge and understanding; transferrable skills; habits of mind; career skills; attitudes and values.

- Should be developed using action words (if you can see it, you can assess it).
- Use compound statements judiciously.
- Use complex statements judiciously.

Curriculum Grid

A chart identifying the key learning outcomes addressed in each of the curriculum's key elements or learning experiences (Suskie, 2019). A good curriculum:

- Gives students ample, diverse opportunities to achieve core learning outcomes.
- Has appropriate, progressive rigor.
- Concludes with an integrative, synthesizing capstone experience.
- Is focused and simple.
- Uses research-informed strategies to help students learn and succeed.
- Is consistent across venues and modalities.
- Is greater than the sum of its parts.

<u>Target Performance</u> (previously referred to as 'Threshold')

The level of performance at which students are doing well enough to succeed in later studies (e.g., next course in sequence or next level of course) or career.

Actual Performance

How students performed on the specific assessment. An average score is less meaningful than a distribution of scores (for example, 72% of students met or exceeded the target performance, 5% of students failed the assessment).

Closing the Loop

The process of following up on changes made to curriculum, pedagogy, materials, etc., to determine if the changes had the desired impact.

Continuous Improvement

An idea with roots in manufacturing, that promotes the ongoing effort to improve. Continuous improvement uses data and evidence to improve student learning and drive student success.

Direct evidence

Evidence based upon actual student work; performance on a test, a presentation, or a research paper, for example. Direct evidence is tangible, visible, and measurable.

Indirect evidence

Evidence that serves as a proxy for student learning. May include student opinion/perception of learning, course grades, measures of satisfaction, participation. Works well as a complement to direct evidence.

<u>HIEE – High Impact Educational Experiences</u>

Promote student learning through curricular and co-curricular activities that are intentionally designed to foster active and integrative student engagement by utilizing multiple impact strategies.