NAACLS Year 5 Interim Report Medical Laboratory Sciences Program



WEBER STATE UNIVERSITY

2013/2014 to 2018/2019

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Table of Contents

Program Review and Curriculum	3
Summary of Annual Reporting	4
Analysis of Outcomes Measures (MLT & MLS)	5-8
Program Assessment, QA, and Non-Quantifiable Measures	9-11
Program Changes/Curriculum Development	12-14
Evidence of Learning: All MLS courses	15-123

Year 5 Interim Report Medical Laboratory Sciences Weber State University

Program Overview

The Medical Laboratory Sciences program is located within the Dr. Ezekiel R. Dumke College of Health Professions at Weber State University (WSU). It provides undergraduate education in Medical Laboratory Sciences for students wishing to complete degrees that include the MLS Laboratory Professional (Track 1) Bachelor of Sciences Degree, MLS Pre-professional (Track II) Bachelor of Sciences Degree, MLS Associate of Applied Sciences Degree (MLT), and a Clinical Laboratory Assistant Certificate of completion. It also serves students seeking MLS courses for continuing education, personal interest, or certification examination preparation.

Curriculum:

Types of degrees and certificates offered:

- Associate of Applied Science (AAS) in MLS
- Bachelor of Science (BS) in MLS Track I
- Bachelor of Science (BS) in MLS Track II
- Clinical Laboratory Assistant (CLA) Certificate of Completion

Summary of last 5 years of annual reporting

Table 1 below summarizes the last 5 years of annual reporting. In order to include 5 years of BOC pass rates, the table includes a six year period.

The post-graduation placement rate for both MLT and MLS graduates is 100% as defined by NAACLS, which states: The number who found employment (in the field or related field) and/or continued their education within one year of graduation. The BOC rates shown display pass rate within one year of graduation.

Enrolled=students registered for any MLS course (s) during the academic fiscal year.

Table 1

Academic Year	Numbered		Graduation		BOC Certification		Placement Rates	
	of studer	nts 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%
2015-16	76	63	94.5%	98.5%	95%	84%	100%	100%
2014-15	90	105	96.2%	97.4%	97.5%	88%	100%	100%
2013-14	N/A	N/A	N/A	N/A	93%	94%	N/A	N/A

Analysis of Outcomes Measures

Program outcomes for MLT and MLS are as follows:

- 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.

Analysis of Outcomes

To analyze outcomes measures and promote continuous quality improvement, the MLS department at WSU administers a variety of assessments in each course as outlined in **Table 2.** Analysis of outcomes per MLS course begins on page 15 of this report.

Table 2:

Core Courses- See Learning Outcomes and key on the next page.

Learning Outcomes

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

*Online students only

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

WSU Year 5 Interim Report

E = Emphasized

U = Utilized

A = Assess comprehensively

NA = Not Addressed

Program Assessment and Quality Improvement

In addition to course analyses, the following assist in measuring on-going quality of the MLT and MLS programs

- Analysis of <u>BOC Scores:</u> Scores for the BOC for the most recent year are analyzed and compared with prior years to detect trends. Each faculty is given a copy of compiled student scores broken down by discipline including average scores for the past 3-4 years.
- <u>Advisory Board Meeting</u>s: Annual meeting with WSU's advisory board assists in obtaining firsthand knowledge from community clinics and hospitals hosting MLS students in clinical rotations.
- <u>Graduate Exit Surveys</u>: Feedback from alumni allows for continued improvement and quality in the programs.
- <u>Annual Staff Retreat</u>: A yearly meeting assists in gathering feedback from faculty and staff, assess what's working and establish goals for the next academic year.
- <u>Student evaluations</u> are completed in each course by the students at the end of the semester. The evaluations are analyzed and compiled by the Department Chair and are used in yearly faculty evaluations and tenure reviews.
- <u>Faculty annual review</u> on full time and adjunct faculty during the summer with individual faculty and the department chair. Student evaluations are reviewed and discussed in detail. Goals and expectations are set and reviewed.
- <u>Tenure-track faculty second year reviews</u> Done by the department chair according to university policy, and with the results submitted to the faculty professional files.
- <u>Peer reviews</u> of all faculty are conducted during the third and sixth years of the tenure process by a department peer review committee using guidelines established by the college ranking and tenure document.
- <u>Ranking and tenure reviews</u> are conducted by a college ranking and tenure committee in accordance to the policy and procedures of the university and college. The evaluation measures effectiveness in teaching, scholarship and service. The results are submitted to the faculty professional files in the department and College.

Non Quantifiable Measures

Professionalism, ethics, and communication skills (program goals 7 and 8) are standards for which quantitative measures are not suitable. The affective domain rubric (Table 3) provides a consistent measure of such skills and the ability for faculty to measure students' abilities in the realm of communication and ethics. This assessment is used as a metric for students who wish to enter the MLT program and in MLS student labs, thereafter.

I. Instructions	Needs Improvement	Satisfactory
Prepares prior to laboratory session by reading	123	4 5
appropriate procedure(s) to be performed.	125	т <i>5</i>
Listens to instructor's demonstration/ oral		
directions and takes notes as necessary before	1 2 3	4 5
beginning laboratory work.		
Works independently when required.	1 2 3	4 5
Attempts to look for answers to questions in the		
"principle of test" section at the beginning of each	1 2 3	4 5
procedure, case studies, and the laboratory		
instructions before asking the instructor.		
II. Procedures		
Uses proper and safe techniques in manual	1 2 2	A E
manipulations: pipetting, use of PPE, order of	1 2 3	4 5
Addition of reagents, mixing, etc.	1.2.2	1 5
wears appropriate lab attire.	1 2 3	4 5
Works in a methodical and reasonable pace,		
within appropriate intervals and acceptable test	1 2 3	4 5
turn-around times.		
	1.2.2	1 5
III Professionalism	1 2 3	4 3
	1.0.0	4 7
Participates in group discussions.	1 2 3	4 5
Accepts constructive criticism.	1 2 3	4 5
Uses assertive communication instead of passive	1.0.0	
or aggressive communication styles with fellow	1 2 3	4 5
students and instructor.		
Demonstrates positive attitude toward workload,		
even if challenging patient situations, lengthy	1 2 3	4 5
procedures, or complex testing are involved.		
Appropriately manages stress levels by		
minimizing distractions to self and others. Does	123	4 5
not talk excessively about subjects unrelated to	1 2 0	
this laboratory.		
Comes to lab on time, prepared to work.	1 2 3	4 5
IV. Laboratory Skills		
Consistently attempts to organize work efficiently.	1 2 3	4 5
Completes all assignments, written and practical,	1 2 3	4 5
on time.		
Identifies errors and takes corrective action as	1 2 3	4 5
soon as possible.		

Performs all laboratory procedures, applying high standards of quality, confidence, and integrity.	123	4 5
Performs procedures after the initial instruction with ease, accuracy, and minimal assistance from fellow students, TAs, and/or instructor.	123	4 5
Keeps work area clean.	1 2 3	4 5

Program Changes/Improvements

No significant program changes have occurred in the last 5 years. Personnel changes include the appointment of new Department Chair and a new Program Director, which took place in 2016 and 2018, respectively. Credentials and contact information are located on the cover page of this report. A number of junior faculty also joined the department as well as a second laboratory manager.

Ongoing Curriculum Development

Addition of Clinical Immunology Course in 2015

As previously mentioned, BOC scores are part of WSU's ongoing MLS program assessment. As of fall of 2015 a Clinical Immunology and Virology Course was added to the MLS curriculum to address a trend of lower BOC scores in that discipline and to offer students a clinically based Immunology course. Upon addition of the course, Immunology BOC scores have shown improvement. Below is a graph put together by the instructor that demonstrates improvement.



Future Courses

Two new courses are in the plans to be added Fall 2021. Both courses will be taught at the MLS level. <u>Urinalysis and Body Fluids</u> and <u>Molecular Diagnostics</u> attempt to address similar BOC trends (particularly in Body Fluids) and will add instruction relevant to current methodologies in MLS. In addition, the courses serve to address **advisory board and employer feedback** regarding

students' unfamiliarity in these areas upon entry level employment. The screenshot below shows the minutes for the advisory board meeting where the issue of Body Fluids was first brought up in 2017.

• • •		E N ·	J 🖨 🤋	7				🔊 Advi:	ory Board	minutes 2.6.	.17			
Home	Inser	Design	Layout	References	Mailings	Review	View	Acrobat	Table De	sign La	yout			
Paste		ambria (Hea 3 I <u>U</u>	• 12 •	A A A A	ă• A∕∕	= • <u> </u> = • •		•= <u>^</u> +		AaBbCcDdEe Normal	AaBbCcDdEe No Spacing	AaBbCcD Heading 1	AaBbCcDdE Heading 2	AaBb
	×Χ		1		2	3		4		ş I	6			8
	Ē				a half day	is good a	t a faci	lity and t	hat the	students	s have to o	do it. Lyn	ette	
					stated tha	it it is goo	d for o	our stude	nts to se	e the eff	fort of wh	ere the sa	mple	
					comes fro	m, that th	iere is	a person	on the o	end of th	at sample	e. Some ar	e	
					infants, so	ome samp	les are	e nard to	acquire	. It was a	asked If w	e want th	e MLS	
					students	o De invo	Ivea in	1 manage	MIS wo	ie respo	nse was t	nat it wou	One	
					day of mi	e MLS Stu	Scott	Smith e	MLS WO	they are	taking to	o many or	oline	
					students :	at his facil	lity to y	work in t	heir mid	ro and	that it is t	o much	mile	
					Heather s	tated that	the ex	vnosure i	n Micro	at WSU	is really s	ignificant	and	
					that the s	tudents a	re verv	v prepare	d. The	students	won't kn	ow how e	ach	
					facility is	run, but t	hey do	know m	icro. Sh	e also st	ated that	at her site	e, she	
					will ask tl	ne studen	ts ques	stions rel	ating to	micro si	ituations.			
1	V	Vhat can	MLS do	to	Body flui	ls were m	ention	ned by M	eischa a	nd Pam,	they said	that they	do 3 to	
	i	mprove t	he skills	of their	5 per day	on the ma	anual s	side, so tl	nat expe	rience w	ould be g	<mark>reat.</mark> Brit	and	
	s	tudents?			April said	that the s	studen	ts didn't	know th	ie conde	nser on a	microsco	pe, and	
					suggestee	l that they	/ have	a micros	cope ref	resher a	t some po	oint. Cellu	lar	
					identifica	tion, urina	alysis a	and hema	tology	were the	ir weakes	st. A refre	sher	
					before th	ey come b	ack ou	it on thei	r rotatio	on would	be helpf	ul. We rea	lize	
					that there	are thing	s that	they will	only se	e in a rea	al hospita	l setting.	Iride-	
					line draw	s, specim	en is co	ontamina	ited, and	sne spe	ends time	teaching	tnem	
-					this. Janie	Talling	ackay	salu that	they co	ulu mak	e some si	ides and s	ena	
1	T.	Vere our	etudente		Organizat	ion of the	rotati	one? The	as well.	ciate th	at Christy	gives the	m the	
1	, r	renared	7 7	·	informati	on in adv	ance 1	They wis	h they c	ould hav	e seen mi	icro and h	lood	
-	F	repareu	•		bank. The	v love cel	l wash	ers. excit	ed abou	it the tec	c seen ni	and the	1004	
1					maintena	nce. The	0C. 01	ır studer	ts have	nothing	but great	things to	sav	
					about all	of the site	s. Sen	d out abo	out 57 st	udents l	ast summ	er, had no	ົ້	
-					incidents	that we w	vere av	vare of, s	o thank	s so muc	h. Matt c	omments	about	
-				1	h + h	4 d a t a h	- h - • • • •	A	**** ***	ه اد دهم ا اس			6	

More flexibility in Online Courses:

In fall semester of 2017 all MLS online courses began to be offered every semester for added flexibility to online students.

Data Management

Upon initiation of online course offerings every semester, enrollment has significantly increased. The MLS department has contracted a programmer to create a custom database to increase accuracy of records and reports. Improved data management, explains the increase in numbers enrolled as the university is more efficiently tracking declared majors in our programs, along with increasing enrollment numbers in the online program.

Budget /New Instrumentation

To continue to excel in a simulation-based curriculum, the MLS department budgeted funds to secure a laboratory information system (LIS) equipped with interface to be operated by students in SIM lab. The LIS was officially introduced in 2014. New Chemistry and Coagulation analyzers were also added to SIM lab in 2016 and 2017, respectively. We have also added two new hematology analyzers in 2015 and 2017. Microbiology added a new blood culture analyzer and automated organism ID instrument this year. Funds are allocated every year to acquire new or updated instrumentation for simulated labs.

Evidence of Learning by Course

Evidence of Learning: MLS 1010 Core Laboratory Skills

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*								
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					
		M 1	M 1	MLS program.	M 1				
Learning Outcome 2:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:				
Apply mathematical	Multiple choice	Students will score	The majority of	Most students	No changes needed				
calculations to	questions in Exam	80% or better on	students scored	successfully	at this time				
laboratory situations.	4 assess absolute	50 questions.	80% or better on	applied					
	and raw sperm		Exam 4.	mathematical					
	counts			calculations to					
				aboratory					
	Maagura 2.	Maggura 2.	Maggura 2.	Magguro 2:	Maagura 2.				
	Formative	Students will	The majority of the	Students	No changes needed				
	assessment in the	correctly perform	students correctly	understand the	at this time				
		concerty perioriti	station concerty						

WSU Year 5 Interim Repo	rt				
	Evidence of	of Learning: Courses w	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**
Students will	Direct and Indirect	Student Learning	Outcomes		
Students will	Monsures*				
	auiz 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	C10 55.	Situations.	
	absolute and raw	to apply to			
	sperm counts.	laboratory			
	1	situations.			
Learning Outcome 3:	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
procedures from simple	knowledge theory	students will score	students scored	successfully	at this time
to complex, including	of Phlebotomy	80% or better on	80% or better on	demonstrated their	
specimen collection and		50 questions	Exam 4.	understanding of	
processing, analysis,				phlebotomy theory.	
interpretation, and use	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:
of quality assurance	Demonstrate	Students will	The majority of	Most students	No changes
procedures.	knowledge of	correctly perform	students were able	were able to apply	needed at this time
	phiedolomy by	phiedotomy on a	to successfully	and successfully	
	performing a	classifiate.	periori	draw blood	
	svringe and a		pincotoniy.	diaw biobu.	
	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	

WSU Year 5 Interim Repo	ort				
	Evidence of	of Learning: Courses w	vithin the Major: MLS	5 1010	
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**
				performed as practical work.	
	Measure 2: Five laboratory sessions requiring students to perform urine microscopic examination and reagent test strips.	Measure 2: Students must score 80% or better on laboratory assignments.	Measure 2: The majority of students scored 80% or better on urine microscopic and reagent test strips laboratory assignments.	Measure 2: The majority of students performed the required skills during their laboratory assignments demonstrating proficiency in urinalysis.	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 Urinalysis Case Studies from Unit 2.	Measure 1: Students will score 80% or better on 6 case studies.	Measure 1: The majority of students scored 80% or better on 6 case studies.	Measure 1: The majority of students successfully demonstrated theory underlying urinalysis and how it relates to renal disease.	Measure 1: No changes needed at this time
Learning Outcome 6: Relate laboratory findings to common disease.	Measure 1: A set of Urinalysis Case Studies from Unit 2.	Measure 1: Students will score 80% or better on 6 case studies.	Measure 1: The majority of students scored 80% or better on 6 case studies.	Measure 1: The majority of students successfully demonstrated theory underlying urinalysis and how it relates to renal disease.	Measure 1: No changes needed at this time

WSU Year 5 Interim Rep	ort				
	Evidence of	of Learning: Courses v	vithin the Major: MLS	1010	
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: 50 questions on Exam 3 dealing with renal disease.	Measure 2: Students will score 80% or better on the Unit 2 exam.	Measure 2: The majority of students were able to score 80% or better.	Measure 2: The majority of students correctly related laboratory findings to common renal diseases.	Measure 2: No 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 2: Adherence to laboratory dress code and safety procedures through viewing safety videos and discussions during the first lab session.	Measure 1: Students will attend laboratory section and be punctual. Measure 2: Students will comply with dress code and safety procedures.	Measure 1: The majority of students attended laboratory sessions unless previously excused. Measure 2: All students complied with dress code and safety procedures.	Measure 1: The majority of students attended laboratory sessions and most were punctual. Measure 2: Most students were in compliance with dress code and safety procedures. OSHA compliant dress was a problem at times.	Measure 1: No changes needed at this time. Measure 2: For campus students, addition of a self- assessment tool for OSHA compliance, worth points OR require all students wear
Learning Outcome 8: Demonstrate effective communication skills and behaviors with colleagues in the program and in the laboratory	Measure 1: Class discussions and open-ended questions	Measure 1: Students will participate in class discussions when open ended questions are asked regarding the material.	Measure 1: Students are able to communicate their knowledge through class discussion	Measure 1: All students were able to communicate their knowledge through class discussions.	scrubs to lab. Measure 1: No changes needed at this time.

WSU Year 5 Interim Repo	ort				
	Evidence of	of Learning: Courses v	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: 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						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of 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	
of theory underlying	comprehensive	expected to score	students were able	who achieve	needed 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	
	sessions that focus	expected to score	students were able	who achieve	needed 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.		
Learning Outcome 2:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	
Apply mathematical	Multiple choice	Students will score	The majority of	Most students	No changes	
calculations to	questions in Exam	80% or better on	students scored	successfully	needed at this time	
laboratory situations.	4 assess absolute	50 questions.	80% or better on	applied		
	and raw sperm		Exam 4.	mathematical		
	counts			calculations to		
				laboratory		
				situations.		
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:	
	Formative			Students		

Evidence of Learning: Courses within the Major: MLS 1113

	Evidence of Learning: Courses within the Major: MLS 1113						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
	assessment in the	Students will	The majority of	understand the	No changes		
	form of a group	correctly perform	the students	concept and are	needed at this time		
	quiz during lecture	mathematical	correctly	able to apply it in			
	following the	calculations in	performed	laboratory			
	sperm count	class and answer	mathematical	situations.			
	lecture assesses	questions as a	calculations in				
	calculating	group and be able	class.				
	absolute and raw	to apply to					
	sperm counts.	laboratory					
		situations.					
Learning Outcome 3:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:		
Perform laboratory	Unit 4 Exam tests	The majority of	The majority of	Students	No changes		
procedures from simple	knowledge theory	the students will	students scored	successfully	needed at this time		
to complex, including	of Phlebotomy	score 80% or	80% or better on	demonstrated their			
specimen collection and		better on 50	Exam 4.	understanding of			
processing, analysis,		questions		phlebotomy			
interpretation, and use				theory.			
of quality assurance	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:		
procedures.	Demonstrate	Students will	The majority of	Most students	No changes		
	1 1 1 C						
	knowledge of	correctly perform	students were able	were able to apply	needed at this time		
	phlebotomy by	correctly perform phlebotomy on a	students were able to successfully	were able to apply the theory learned	needed at this time		
	phlebotomy by successfully	correctly perform phlebotomy on a classmate.	students were able to successfully perform	were able to apply the theory learned and successfully	needed at this time		
	knowledge of phlebotomy by successfully performing a	correctly perform phlebotomy on a classmate.	students were able to successfully perform phlebotomy.	were able to apply the theory learned and successfully draw blood.	needed at this time		
	knowledge of phlebotomy by successfully performing a syringe and a	correctly perform phlebotomy on a classmate.	students were able to successfully perform phlebotomy.	were able to apply the theory learned and successfully draw blood.	needed at this time		
	knowledge of phlebotomy by successfully performing a syringe and a vacutainer draw on	correctly perform phlebotomy on a classmate.	students were able to successfully perform phlebotomy.	were able to apply the theory learned and successfully draw blood.	needed at this time		

Evidence of Learning: Courses within the Major: MLS 1113					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
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
theory and terminology	multiple choice	80% or better on	students scored	successfully	needed 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	students scored	students performed	needed at this time
	students to perform	better on	80% or better on	the required skills	
	urine microscopic	laboratory	urine microscopic	during their	
	examination and	assignments.	and reagent test	laboratory	
	reagent test strips.		strips laboratory	assignments	
			assignments.	demonstrating	
				proficiency in	
				urinalysis.	

	Evidence of Learning: Courses within the Major: MLS 1113					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
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	
laboratory data and	Case Studies from	80% or better on 6	students scored	students	needed 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	
findings to common	Case Studies from	80% or better on 6	students scored	students	needed 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	
	with renal disease.	the Unit 2 exam.	to score 80% or	related laboratory	time.	
			better.	findings to		
				common renal		
				diseases.		

Evidence of Learning: Courses within the Major: MLS 1113					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
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
professional conduct	punctuality	attend laboratory	students attended	students attended	needed at this
and ethical behavior	expectations	section and be	laboratory sessions	laboratory sessions	time.
	defined in course	punctual.	unless previously	and most were	
	syllabus.		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	students, addition
	code and safety	code and safety	dress code and	compliance with	of a self-
	procedures through	procedures.	safety procedures.	dress code and	assessment tool
	viewing safety			safety procedures.	for OSHA
	videos and			OSHA compliant	compliance, worth
	discussions during			dress was a	points OR require
	the first lab			problem at times.	all students wear
	session.				scrubs to lab.
Learning Outcome 8:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:
Demonstrate effective	Class discussions	Students will	Students are able	All students were	No changes
communication skills	and open-ended	participate in class	to communicate	able to	needed at this
and behaviors with	questions	discussions when	their knowledge	communicate their	time.
colleagues in the		open ended	through class	knowledge through	
program and in the		questions are	discussion	class discussions.	
laboratory		asked 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	

Evidence of Learning: Courses within the Major: MLS 1113								
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use			
Goal	Measurement	Evidence of	Learning	Findings	of Results**			
		Student Learning	Outcomes					
Students will	Direct and Indirect							
	Measures*							
	phlebotomy lab	2 reflective	themselves and	self-evaluated	needed at this			
	competency.	questions and	offer suggestions	allowing them to	time.			
		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 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 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.

	Evidence of Learning: MLS 1114					
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: 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	80% or better on	successfully	pedagogical	
underlying laboratory	hematology	better on exams,	both exams.	demonstrated	changes needed at	
testing using analytical,	testing. The Unit 5	proving		theory underlying	this time	
interpretive, and	exam tests the	competency. If		laboratory testing		
problem-solving skills.	principles of	they do not score				
	hemostasis testing.	above 80%, they				
	50 multiple choice	are required to				
	questions each.	score well on a				
		retake 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.				
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	80% or better on 8	successfully	pedagogical	
laboratory situations.	mathematical	better on these	questions.	applied	changes needed at	
	calculations in	questions.		mathematical	this time	
	exam 1, 2 and 5			calculations to		

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	Learning	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
				laboratory		
				situations.		
	Measure 2:	Measure 2: >90%	Measure 2: 100%	Measure 2: 100%	Measure 2: No	
	Laboratory	of students will	of students	of students	clinical changes	
	sessions requiring	correctly perform	correctly	correctly	needed at this time	
	applications of	mathematical	performed	performed		
	laboratory	calculations in	mathematical	mathematical		
	mathematical	laboratory	calculations in	calculations in		
	calculations	situations.	laboratory	laboratory		
			situations.	situations.		
Learning Outcome 3:	Measure 1: 50	Measure 1: >90%	Measure 1: 95%	Measure 1: 95%	Measure 1: No	
Perform laboratory	multiple choice	of students will	of students scored	of students	curricular or	
procedures from simple	questions from	score >80% on 60	80% or better on	successfully	pedagogical	
to complex, including	Exam 1 and 10	questions	20 questions.	demonstrated	changes needed at	
specimen collection	multiple choice			knowledge of	this time	
and processing,	questions from			evaluating		
analysis, interpretation,	Exam 5			specimen		
and use of quality				acceptability and		
assurance procedures.				optimal analysis		
				methods.		
	Measure 2:	Measure 2: >90%	Measure 2: >95%	Measure 2: All	Measure 2: No	
	Demonstrate	of students will	of students were	students correctly	clinical changes	
	proper knowledge	correctly	able to correctly	determined proper	needed at this time	
	of specimen	determine proper	determine proper	sample suitability.		
	criteria in a	sample suitability.	sample suitability			
	hematology		for hematology			
	laboratory setting		analysis			

Evidence of Learning: MLS 1114						
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 4:	Measure 1: 50	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No	
Correlate laboratory	multiple choice	of students will	of students scored	of students	curricular or	
theory and terminology	questions each	score 80% or	80% or better on	successfully	pedagogical	
to practical laboratory	from exams 2, 3,	better on all	20 questions	correlated	changes needed at	
work	and 4	questions.		laboratory theory	this time	
				and terminology to		
				practical laboratory		
				work.		
	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	80% or better on	performed the	needed at this time	
	from a wide variety	better on the	the laboratory	required skills		
	of disorders during	laboratory	practical exam and	during the		
	6 laboratory	practical exam and	participated in all	laboratory practical		
	sessions. Assess	participate in all	required laboratory	exam and required		
	competency during	required laboratory	sessions.	laboratory		
	1 laboratory	sessions.		sessions.		
	practical exam					
Learning Outcome 5:	Measure 1: A set	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No	
Gather additional	of 15 multiple	of students will	of students scored	of students	curricular or	
laboratory data and	choice questions	score 80% or	80% or better on	successfully	pedagogical	
apply problem solving	from Exams 1 and	better on 20	20 questions.	demonstrated	changes needed at	
skills to solve	5	questions.		problem solving	this time	
problems/discrepancies.				skills		

	Evidence of Learning: MLS 1114					
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: >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	correlate patient	patient history and		
	laboratory findings	diagnoses to	history and	diagnoses to		
	in 6 laboratory	laboratory findings	diagnoses to	laboratory findings		
	sessions	in 6 laboratory	laboratory findings	in 6 laboratory		
		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	score 80% or	80% or better on	correctly related	pedagogical	
disease.	from exams 2, 3,	better on 50	50 multiple choice	laboratory findings	changes needed at	
	and 4, and 25	multiple choice	questions each	to common	this time	
	questions from	questions each	from exams 2, 3,	diseases.		
	exam 5.	from exams 2, 3,	and 4, and 25			
		and 4, and 25	questions from			
		questions from	exam 5.			
		exam 5.				
	Measure 2: In 6	Measure 2: >90%	Measure 2: 100%	Measure 2: >95%	Measure 2: No	
	laboratory sessions	of students will	of students were	of students	clinical changes	
	students relate	perform the	able to relate	correctly related	needed at this time	
	laboratory findings	required skills in	laboratory findings	laboratory findings		
	to common	the laboratory	to common	to common		
	diseases		diseases.	diseases.		

Evidence of Learning: MLS 1114						
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 7:	Measure 1:	Measure 1: >95%	Measure 1: 100%	Measure 1: >95%	Measure 1: No	
Demonstrate	Attendance and	of students will	attendance in	of students	curricular or	
professional conduct	punctuality	attend laboratory	laboratory section.	attended laboratory	pedagogical	
and ethical behavior	expectations	section and be	>95% punctuality	section and most	changes needed at	
	defined in course	punctual.		were punctual	this time	
	syllabus					
	Measure 2:	Measure 2: >95%	Measure 2: 100%	Measure 2: >95%	Measure 2: No	
	Adherence to	of students will	of students	of students were in	clinical changes	
	laboratory dress	comply with dress	complied with	compliance with	needed at this time	
	code and safety	code and safety	dress code and	dress code and		
	procedures	procedures.	safety procedures	safety procedures.		
Learning Outcome 8:	Measure 1:	Measure 1: >95%	Measure 1: >95%	Measure 1: >95%	Measure 1: No	
Demonstrate effective	Laboratory	of students will be	of students were	of students	curricular or	
communication skills	etiquette and	punctual to	punctual to	demonstrated	pedagogical	
and behaviors with	expectations are	laboratory	laboratory	effective	changes needed at	
colleagues in the	defined in the	sessions, and	sessions, and	communication	this time	
program and in the	syllabus. Measured	remain task-	remained task-	skills through		
laboratory	by punctuality and	oriented	oriented	punctuality and		
	participation.	throughout the	throughout the	tasks during		
		session in order to	session and	laboratory		
		receive full	received full	sessions.		
		participation	participation			
		credit.	credit.			

*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 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.

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

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

Evidence of Learning: MLS 2212					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	specimens per week	mathematical	mathematical	calculations in lab	
	which utilize	calculations in	calculations 80%	situations 80% of	
	correct reporting of	laboratory	or better in	the time or better	
	urine cultures	situations	laboratory		
	involving		situations		
	mathematical				
	calculations				
Learning Outcome 3:	Measure 1: 13	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	score 80% or	80% or better	successfully	pedagogical
to complex, including	activities, each	better on	overall on final	demonstrated	changes needed at
specimen collection	involving	laboratory	course laboratory	knowledge of	this time
and processing,	identification of	activities and	grade	evaluating	
analysis, interpretation,	bacterial unknown	practical exams		specimen	
and use of quality	specimens and 2			acceptability and	
assurance procedures.	practical in-lab			optimal analysis	
	exams			methods.	
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	Demonstrate proper	of students will	of students were	students correctly	clinical changes
	knowledge of	correctly	able to correctly	determined quality	needed at this time
	quality assurance	determine proper	determine proper	assurance	
	procedures in	quality assurance	quality assurance	procedures in	
	clinical	procedures in	procedures in	clinical	
	microbiology	clinical	clinical	microbiology	
	laboratory	microbiology	microbiology	laboratory	
		laboratory	laboratory		

Evidence of Learning: MLS 2212					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
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 3	of students will	students scored	students	curricular or
theory and terminology	quizzes have 50%	score 80% or	80% or better	successfully	pedagogical
to practical laboratory	of questions that	better		correlated	changes needed at
work	correlate			laboratory theory	this time
	theory/terminology			and terminology to	
	to laboratory testing			practical	
				laboratory work.	
	Measure 2: Assess	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	4-5 weekly	of students will	of students scored	students performed	clinical changes
	laboratory	score 80% or	80% or better	the required skills	needed at this time
	unknowns in each	better overall on	overall on course	during 13 lab	
	of the 13 laboratory	course laboratory	laboratory	activities and	
	activities and 1	activities and	activities and	comprehensive lab	
	comprehensive lab	comprehensive lab	comprehensive lab	final	
	final	final	final		
Learning Outcome 5:	Measure 1: Four	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Gather additional	case study	of students must	of students	students	curricular or
laboratory data and	homework	complete	completed the four	successfully	pedagogical
apply problem solving	assignments in Unit	assignments	assignments.	demonstrated	changes needed at
skills to solve	2 and Unit 3.			problem solving	this time
problems/discrepancies.				skills	

Evidence of Learning: MLS 2212					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 6:	Measure 1: Exams	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Relate laboratory	2,3,4 and the final	of students will	of students scored	students correctly	curricular or
findings to common	exam contain	score 80% or	80% or better on	related laboratory	pedagogical
disease.	approximately 10%	better on the	the diagnostic	findings to	changes needed at
	diagnostic	diagnostic	questions	common diseases.	this time
	questions	questions			
	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	
	unknowns is related	specimen	to common	common diseases.	
	to diseases	unknowns to	diseases 80% of		
		related diseases	the time		
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	compliance with	needed at this time
	code and safety	code and safety	dress code and	dress code and	
	procedures	procedures.	safety 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		pedagogical

Evidence of Learning: MLS 2212						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
and behaviors with	laboratory results in	results 80% or	report results 80%	to correctly report	changes needed at	
colleagues in the	13 weekly	better on	or better on	laboratory reports.	this time	
program and in the	activities.	laboratory 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	effective team	effective team	changes needed at	
	activities	work during the 6	work.	work.	this time	
		weeks 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.

** 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 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.
WSU Year 5 Interim Report

	Evide	ence of Learning: Cou	urses within the Major	•	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 1:	Measure 1: 2	Measure 1: 100%	Measure 1:	Measure 1: 86% of	Measure 1: No
Demonstrate	quizzes (100% of	of students will	Approx. 86% of	students	curricular or
knowledge of theory	questions), 3 exams	score 80% or	students scored	successfully	pedagogical
underlying laboratory	and a	better on all test	80% or better all	demonstrated	changes needed at
testing using analytical,	comprehensive	questions (quizzes	exams (avg. 24 of	theory underlying	this time
interpretive, and	final (75% of	are excluded)	28 students)	laboratory testing	
problem solving skills.	questions)				
	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	able to correctly	performed required	needed at this time
	and 1 practical in-	better by correctly	perform required	laboratory skills	
	lab exam	performing	laboratory skills		
		required laboratory			
		skills			
Learning Outcome 2:	Measure 1: 1-2	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Apply mathematical	questions on exam	of students will	of students scored	students	curricular or
calculations to	1 multiple choice	score 80% or	80% or better on	successfully	pedagogical
laboratory situations.		better on math	math questions	applied	changes needed at
		questions		mathematical	this time
				calculations to	
				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	correctly	performed	needed at this time

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
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	unknown patient	better on	performed	mathematical	
	specimens and 1	mathematical	mathematical	calculations in lab	
	week of hospital	calculations in	calculations 80%	situations 80% of	
	urine culture plates,	laboratory	or better in	the time or better	
	which utilize	situations	laboratory		
	correct reporting of		situations		
	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	80% or better	successfully	pedagogical
to complex, including	involving	better on	overall on final	demonstrated	changes needed at
specimen collection	identification of	laboratory	course laboratory	knowledge of	this time
and processing,	bacteria, parasites,	activities and	grade	evaluating	
analysis, interpretation,	and fungi	practical exams		specimen	
and use of quality				acceptability and	
assurance procedures.				optimal analysis	
			2 1000/	methods.	
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	Demonstrate proper	of students will	of students were	students correctly	clinical changes
	knowledge of	correctly	able to correctly	determined quality	needed at this time
	quality assurance	determine proper	determine proper	assurance	
	procedures in	quality assurance	quality assurance	procedures in	
	clinical	procedures in	procedures in	clinical	
		clinical	clinical		

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

	Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 6:	Measure 1: All	Measure 1: 100%	Measure 1: 95% of	Measure 1: 95% of	Measure 1: No	
Relate laboratory	exams contain	of students will	students scored	students correctly	curricular or	
findings to common	approximately 20%	score 80% or	80% or better on	related laboratory	pedagogical	
disease.	diagnostic	better on the	the diagnostic	findings to	changes needed at	
	questions	diagnostic	questions	common diseases.	this time	
		questions				
	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	perform 80% or	able to relate	related laboratory	needed at this time	
	activities, specimen	better relating	laboratory findings	findings to		
	source of unknowns	specimen	to common	common diseases.		
	is related to	unknowns to	diseases 80% of			
	diseases	related diseases	the time			
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	compliance with	needed at this time	

	Evide	ence of Learning: Cou	rses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	code and safety	code and safety	dress code and	dress code and	
	procedures	procedures.	safety 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	11 weekly	better on	or better on		this time
program and in the	activities.	laboratory 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 3 of 11	demonstrate	demonstrated	demonstrated	pedagogical
	weekly laboratory	effective team	effective team	effective team	changes needed at
	activities	work during the 3	work.	work.	this time
		weeks of			
		laboratory			
		activities			

** 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.

WSU Year 5 Interim Report

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

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
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	mathematical	laboratory	calculations in	laboratory	
	calculations	situations.	laboratory	situations.	
			situations.		
Learning Outcome 3:	Measure 1: A set	Measure 1: 100%	Measure 1: 96%	Measure 1: All	Measure 1: No
Perform laboratory	of 20 multiple	of students will	of students scored	students	curricular or
procedures from simple	choice questions	score 80% or better	80% or better on	successfully	pedagogical
to complex, including	from Exams 1 and	on 20 questions	20 questions.	demonstrated	changes needed at
specimen collection	2			knowledge of	this time
and processing,				evaluating	
analysis, interpretation,				specimen	
and use of quality				acceptability and	
assurance procedures.				optimal analysis	
		1000/	1000/	methods.	
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	Demonstrate	of students will	of students were	students correctly	clinical changes
	proper knowledge	correctly determine	able to correctly	determined proper	needed at this time
	of specimen	proper sample	determine proper	sample suitability.	
	criteria in a blood	suitability.	sample suitability		
	bank laboratory		for blood bank		
Leomine Outcome A	Setting	Magazza 1, 1000/	Maggyra 1, 1000/	Maggung 1, A11	Maaguna 1, Na
Learning Outcome 4:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
theory and terminology	of 20 multiple	of students will	80% or better on	successfully	curricular or
to prostical laboratory	from Example 2 and	score 80% or better	20 questions	successfully	peuagogicai
work	2 110111 EXams 2 and	on 20 questions.	20 questions	laboratory theory	this time
WOIK	5			and terminology to	uns une
				and terminology to	

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

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 6:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Relate laboratory	of 25 questions	of students will	of students scored	students correctly	curricular or
findings to common	from Exams 2, 3,	score 80% or better	80% or better on	related laboratory	pedagogical
disease.	and 4	on 25 questions.	25 questions	findings to	changes needed at
				common diseases.	this time
	Measure 2: In 2	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	laboratory sessions	of students will	of students were	students correctly	clinical changes
	students relate	perform the	able to relate	related laboratory	needed at this time
	laboratory findings	required skills in	laboratory findings	findings to	
	to common	the laboratory	to common	common diseases.	
	diseases		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	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	compliance with	needed at this time
	code and safety	code and safety	dress code and	dress code and	
	procedures	procedures.	safety 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				the essay questions	this time

	Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
program and in the			knowledge on the				
laboratory			essay questions				
	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	this time		
	laboratory section	"satisfactory"	assertive	better as the course			
	regarding	marks in	communication	progresses			
	communication.	communication-	with fellow				
		related objectives	students and				
		in Affective	instructor in the				
		Domain	laboratory.				
		Assessment					

** 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 Learni	ing: MLS 2211		
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: Each	Measure 1: Each	Measure 1: All	Measure 1: All	Measure 1:
Demonstrate	exam covers	student must	students with	students with	Findings indicate
knowledge of theory	testing specific to	complete the exam	passing grades	passing grades	no changes are
underlying laboratory	the covered units.	with a score of at	achieved a score of	showed an	needed at this
testing using analytical,		least 80%.	at least 80% on	acceptable level of	time.
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	passing grades	passing grades	no changes are
	laboratory	laboratory must	earned at least	showed	needed at this
	exercises, which	equal at least 80%	80% of the total	competency of the	time.
	require	of the points	points possible.	covered topics and	
	understanding of	possible.		laboratory	
	the testing			exercises.	
	methods.				
Learning Outcome 2:	Measure 1:	Measure 1: Each	Measure 1: All	Measure 1: All	Measure 1:
	Students must	student must pass	students with	students with a	Instituted review
	complete a 40-	the exam with a	passing grades	passing grade can	questions in all

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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Apply mathematical	question lab math	score of at least	scored at least	successfully	subsequent	
calculations to	exam before	80%.	80%.	complete	examinations	
laboratory situations.	beginning lab			laboratory		
	work. Questions			mathematics.		
	are repeated			Continual exposure		
	throughout the			to math throughout		
	year to help			the year, assists		
	students remember			with memory.		
	Measure 2: Graded	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:	
	laboratory	students must	students with	students with	Findings indicate	
	exercises, which	correctly complete	passing grades	passing grades can	no changes are	
	include	laboratory	earned at least	successfully	needed at this	
	calculations.	calculations.	80% of the total	complete	time.	
			points possible.	laboratory		
				mathematics.		
Learning Octoberry 2	M 1.	N	N	M	M	
Learning Outcome 3:	Nieasure 1:	Measure 1: All	Measure 1: All	Nieasure 1: All	Nieasure 1:	
Perform laboratory	Students will	students must	students with	students with	Findings indicate	
to complex including	laboratory final	loborotory final	passing grades	passing grades can	no changes are	
anagiman collection	laboratory final	laboratory final	earned a score of	successiuity	time	
specimen collection	with several	with a score of at	at least 80%.	loborotory tosting	ume.	
and processing,	in difficulty	100%.		national procedures renging		
	in unneutry.			in difficulty		
Learning Outcome 3: Perform laboratory procedures from simple to complex, including specimen collection and processing, analysis, interpretation,	students remember Measure 2: Graded laboratory exercises, which include calculations. Measure 1: Students will complete a laboratory final with several exercises ranging in difficulty.	Measure 2: All students must correctly complete laboratory calculations. Measure 1: All students must complete the laboratory final with a score of at least 80%.	Measure 2: All students with passing grades earned at least 80% of the total points possible. Measure 1: All students with passing grades earned a score of at least 80%.	with memory. Measure 2: All students with passing grades can successfully complete laboratory mathematics. Measure 1: All students with passing grades can successfully complete laboratory testing procedures ranging in difficulty.	Measure 2: Findings indicate no changes are needed at this time. Measure 1: Findings indicate no changes are needed at this time.	

	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
and use of quality	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
assurance procedures.	Demonstrate	Students will	students with	students can assess	Instituted clinical	
	knowledge of	assess samples	passing grades	samples for testing	correlation	
	accurate sample	submitted for	have accurately	as appropriate.	exercises which	
	requirements and	testing for	demonstrated		deal with patient	
	collection	acceptability.	knowledge of		pathologies and	
	procedures.		sample		specimen issues in	
			requirements.		testing to better	
					inform the students	
					regarding sample	
					requirements and	
					collection	
					procedures	
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1:	
Correlate laboratory	Students will	Students will	students with	students with	Findings indicate	
theory and terminology	correlate theory	complete all	passing grades	passing grades can	no changes are	
to practical laboratory	and terminology in	laboratory	earned a score of	correlate theory to	needed at this	
work	all laboratory	correlation	at least 80%.	practical laboratory	time.	
	exercises.	activities with a		situations.		
		score of at least				
		80%.				
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Students must test	Students must	students with	students with	Findings indicate	
	unknown samples	complete the	passing grades	passing grades can	no changes are	
	during laboratory	laboratory section	earned a score of	correlate theory to	needed at this	
	exercises.	with at least 80%.	at least 80%.	practical laboratory	time.	
				situations.		

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1:		
Gather additional	Students must	Students must	students with	students with	Instituted QC labs		
laboratory data and	gather all	obtain all pertinent	passing grades	passing grades can	prior to the		
apply problem solving	applicable data	information which	earned a score of	gather laboratory	introduction of a		
skills to solve	regarding the	is scored on their	at least 80%	data and use it to	new test. Also		
problems/discrepancies.	patient and use it	laboratory section,		solve problems and	instituted a Levy-		
	for a tentative	which must be at		discrepancies	Jennings problem-		
	diagnosis	least 80%			solving worksheet		
	Measure 2: Not	Measure 2: Not	Measure 2: Not	Measure 2: Not	Measure 2: Not		
	applicable.	applicable.	applicable.	applicable.	applicable.		
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	the student's	the exam with a	passing grades	passing grades can	no changes are		
disease.	ability to correlate	score of at least	earned a score of	accurately	needed at this		
	laboratory findings	80%.	at least 80%.	correlate	time.		
	to common			laboratory findings			
	diseases.			to common			
				diseases.	N/ 0		
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:		
	Laboratory	Students must	students with	students with	Findings indicate		
	exercises require	identify laboratory	passing grades	passing grades can	no changes are		

	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
	students to use	results that are not	have accurately	correlate	needed at this	
	disease correlation	consistent with	correlated	laboratory findings	time.	
	to laboratory	patient diagnoses.	laboratory findings	to disease states		
	findings as a QA		on assigned	covered in the		
	tool.		laboratory	course.		
			activities.			
Learning Outcome 7:	Maggura 1. Unit 1	Maagura	Maggura 1: All	Maggura 1: All	Maggura 1.	
Demonstrate	test contains	1.Studente must	students with	students with	Findings indicate	
professional conduct	questions to	nass the test with a	nassing grades	passing scores	no changes are	
and ethical behavior	include	score of at least	scored at least 80%	have an	needed at this	
	professional	80%	on the test	introductory	time	
	behavior	0070.	on the test.	understanding of	unic.	
	oonavior.			professional		
				behavior.		
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Adherence to	Students must	students with	students with	Findings indicate	
	proper laboratory	comply with dress	passing grades	passing grades are	no changes are	
	dress code and	code requirements	properly gowned	aware of proper	needed at this	
	common	for safety and	laboratory clothing	laboratory attire	time.	
	regulatory	HIPPA	(i.e. lab coat) and	and HIPPA		
	requirements (i.e.	requirements.	showed	regulations that are		
	HIPPA)		compliance to	discussed.		
			HIPPA regulations			

	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
			they were exposed			
			to.			
Learning Outcome 8:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:	
Demonstrate effective	Laboratory	students must	students with	students with	Findings indicate	
communication skills	exercises require	accurately identify	passing grades	passing grades	no changes are	
and behaviors with	students to	all critical values	were able to	know the	needed at this	
colleagues in the	communicate	and properly report	identify critical	importance of	time.	
program and in the	critical values to	them to the	values.	prompt and		
laboratory	the healthcare	provider.		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	
	interactions	outlined in the	appropriately with	importance of	time.	
	amongst peers.	course syllabus.	their colleagues.	prompt and		
				professional		
				interaction.		

** 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.

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: MLS 2213					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use of	
Goal	Measurement	Evidence of	Learning	Findings	Results**	
0.1.1.11		Student Learning	Outcomes			
Students will	Direct and Indirect					
Les mine Orsteene 1	Measures*	Maaaaa 1. East	M	N	M	
Learning Outcome 1:	Measure 1: Each	Measure 1: Each	Measure 1: All	Measure 1: All	Measure 1: Eindings indicate	
knowledge of theory	testing specific to	student must	students with	students with	rindings indicate	
underlying laboratory	the covered units	with a score of at	achieved a score of	showed an	no changes are	
testing using analytical	the covered units.	least 80%	at least 80% on	acceptable level of	time	
interpretive, and			each unit exam.	understanding of	unite.	
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	passing grades	passing grades	no changes are	
	laboratory	laboratory must	earned at least	showed	needed at this	
	exercises, which	equal at least 80%	80% of the total	competency of the	time.	
	require	of the points	points possible.	covered topics and		
	understanding of	possible.		laboratory		
	methods			exercises.		
Learning Outcome 2.	Measure 1.	Measure 1: Each	Measure 1. All	Measure 1. All	Measure 1.	
Apply mathematical	Students must	student must pass	students with	students with a	Instituted review	
calculations to	complete a 40-	the exam with a	passing grades	passing grade can	questions in all	
laboratory situations.	question lab math	score of at least	scored at least	successfully	subsequent	
	exam before	80%.	80%.	complete	examinations	
	beginning lab			laboratory		
	work. Questions			mathematics.		

Evidence of Learning: Courses within the Major: MLS 2213 Principles of Clinical Chemistry II

	Evidence of Learning: MLS 2213					
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*					
	are repeated			Continual exposure		
	throughout the year			to math throughout		
	to help students			the year, assists		
	remember			with memory.		
	Measure 2: Graded	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:	
	laboratory	students must	students with	students with	Findings indicate	
	exercises, which	correctly complete	passing grades	passing grades can	no changes are	
	include	laboratory	earned at least	successfully	needed at this	
	calculations.	calculations.	80% of the total	complete	time.	
			points possible.	laboratory		
				mathematics.		
Learning Outcome 3:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:	
Perform laboratory	Students will	students must	students with	students with	Findings indicate	
procedures from simple	complete a	complete the	passing grades	passing grades can	no changes are	
to complex, including	laboratory final	laboratory final	earned a score of	successfully	needed at this	
specimen collection	with several	with a score of at	at least 80%.	complete	time.	
and processing,	exercises ranging	least 80%.		laboratory testing		
analysis, interpretation,	in difficulty.			procedures ranging		
and use of quality				in difficulty.		
assurance procedures.	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Demonstrate	Students will	students with	students can assess	Instituted clinical	
	knowledge of	assess samples	passing grades	samples for testing	correlation	
	accurate sample	submitted for	have accurately	as appropriate.	exercises which	
	requirements and	testing for	demonstrated		deal with patient	
	collection	acceptability.	knowledge of		pathologies and	
	procedures.		sample		specimen issues in	
			requirements.		testing to better	

Evidence of Learning: MLS 2213						
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*					
					inform the	
					students regarding	
					sample	
					requirements and	
					collection	
					procedures	
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1:	
Correlate laboratory	Students will	Students will	students with	students with	Findings indicate	
theory and terminology	correlate theory	complete all	passing grades	passing grades can	no changes are	
to practical laboratory	all laboratory	aboratory	earned a score of	prestical laboratory	time	
WUIK	an iaboratory	activities with a	at least 00%.	situations	ume.	
	exercises.	score of at least		situations.		
		80%				
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Students must test	Students must	students with	students with	Findings indicate	
	unknown samples	complete the	passing grades	passing grades can	no changes are	
	during laboratory	laboratory section	earned a score of	correlate theory to	needed at this	
	exercises.	with at least 80%.	at least 80%.	laboratory	time.	
				situations.		
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1:	
Gather additional	Students must	Students must	students with	students with	Instituted QC labs	
laboratory data and	gather all	obtain all pertinent	passing grades	passing grades can	prior to the	
apply problem solving	applicable data	information which	earned a score of	gather laboratory	introduction of a	
skills to solve	regarding the	is scored on their	at least 80%	data and use it to	new test. Also	
problems/discrepancies.	patient and use it	laboratory section,		solve problems and	instituted a Levy-	
				discrepancies		

	Evidence of Learning: MLS 2213					
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*					
	for a tentative	which must be at			Jennings problem-	
	diagnosis	least 80%			solving worksheet	
	Measure 2: Most	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:	
	laboratory	Students must	students with	students with	Findings indicate	
	activities require	correct	passing grades	passing grades are	no changes are	
	the students to	discrepancies in	earned a score of	able to identify and	needed at this	
	troubleshoot	order to report out	at least 80%.	correct	time.	
	specimen/result	correct results with		discrepancies in		
	discrepancies.	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	the student's	the exam with a	passing grades	passing grades can	no changes are	
disease.	ability to correlate	score of at least	earned a score of	accurately	needed at this	
	laboratory findings	80%.	at least 80%.	correlate	time.	
	to common			laboratory findings		
	diseases.			to common		
				diseases.		
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Laboratory	Students must	students with	students with	Findings indicate	
	exercises require	identify laboratory	passing grades	passing grades can	no changes are	
	students to use	results that are not	have accurately	correlate	needed at this	
	disease correlation	consistent with	correlated	laboratory findings	time.	
	to laboratory	patient diagnoses.	laboratory findings	to disease states		
	findings as a QA		on assigned	covered in the		
	tool.			course.		

		Evidence of Learni	ng: MLS 2213		
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*				
			laboratory		
			activities.		
Learning Outcome 7:	Measure 1: The	Measure	Measure 1: All	Measure 1: All	Measure 1:
Demonstrate	final exam contains	1:Students must	students with	students with	Findings indicate
professional conduct	questions that	pass the test with a	passing grades	passing scores	no changes are
and ethical behavior	cover professional	score of at least	scored at least 80%	have an	needed at this
	behavior.	80%.	on the test.	introductory	time.
				understanding of	
				professional	
				behavior.	
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:
	Adherence to	Students must	students with	students with	Findings indicate
	proper laboratory	comply with dress	passing grades	passing grades are	no changes are
	dress code and	code requirements	properly gowned	aware of proper	needed at this
	common regulatory	for safety and	laboratory clothing	laboratory attire	time.
	requirements (i.e.	HIPAA	(i.e. lab coat) and	and HIPAA	
	HIPAA)	requirements.	showed	regulations that are	
			compliance to	discussed.	
			HIPAA regulations		
			they were exposed		
			to.		
Learning Outcome 8:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:
Demonstrate effective	Laboratory	students must	students with	students with	Findings indicate
communication skills	exercises require	accurately identify	passing grades	passing grades	no changes are
and behaviors with	students to	all critical values	were able to	know the	needed at this
colleagues in the	communicate	and properly report		importance of	time.

	Evidence of Learning: MLS 2213							
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*							
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			
	interactions	outlined in the	appropriately with	importance of	time.			
	amongst peers.	course syllabus.	their colleagues.	prompt and				
				professional				
				interaction.				

** 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.

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

	Evide	ence of Learning: Cou	rses within the Major		
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: Exam	Measure 1: 100%	Measure 1: 84% of	Measure 1: four	Measure 1: No
Demonstrate	three focused on	of students will	students scored an	students did not	changes are
knowledge of theory	pre-use validation	score at least 80%	80% or better	achieve 80% but	needed to this unit
underlying laboratory	of clinical	on this exam	(range: 58 – 100)	upon retake they	exam
testing using analytical,	instrumentation			earned the required	
interpretive, and				80% grade	
problem-solving skills.	Measure 2: Problem	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	based practical	of students will	of students scored	students performed	changes are
	exam containing a	score at least 80%	an 80% or better	adequately on	needed to this unit
	five-part pre-use	on the practical	(range: 85-100)	applying their	practical (changes
	validation of a new	exam		knowledge in a	were made to
	clinical test.			problem-based	make it easier for
				assignment	students to
					perform
					calculations not
					directly taken from
					CLSI standard
					manual)
Learning Outcome 2:	Measure 1: A series	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
	of homework	of students will	of students	students were able	changes are
	assignments (n= 14)	compute and	completed all	to apply common	needed to these

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	Findings	Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Apply mathematical	covering; t-Test, F-	interpret the	homework	laboratory	series of
calculations to	Test, ANOVA, Chi-	findings.	assignments and	mathematical	homework
laboratory situations.	Squared Test,		either interpreted	calculations and	assignments
	Correlation,		their findings	understand their	
	Reference Ranges,		correctly or	results	
	Standard Error of		understood where		
	the Mean,		they made an error		
	Sensitivity,				
	Specificity, Positive				
	Predictive Value,				
	Negative Predictive				
	Value, Accuracy,				
	Precision,				
	Minimum Detection				
	Limit				
	Measure 2: Two	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	problem based	of students will	of students scored	students were able	changes are
	practical exams	score at least 80%	an 80% or better	to apply	needed to the two
		on the practical	(range: 83-100)	mathematical	practical exams
		exam		calculations to real	
				laboratory	
				situations	

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	Findings	Results**	
		Student Learning	Outcomes	_		
Students will	Direct and Indirect	_				
	Measures*					
Learning Outcome 3:	This course focuses	NA	NA	NA	NA	
Perform laboratory	on advanced					
procedures from simple	application of					
to complex, including	laboratory					
specimen collection	mathematical					
and processing,	theory, research					
analysis, interpretation,	methods, and					
and use of quality	financial lab					
assurance procedures.	management. As					
	such, there are no					
	'wet' lab					
	procedures taught					
	or conducted. The					
	students do					
	participate in a					
	computer lab.					
Learning Outcome 4:	Measure 1: Three	Measure 1: 100%	Measure 1: 84%	Measure 1: 8	Measure 1: No	
Correlate laboratory	(total= 4) unit	of students will	of students scored	students	changes are	
theory and terminology	examinations focus	score at least 80%	an 80% or better	individually did	needed for these	
to practical laboratory	on theory and	on this exam	(range 58-100)	not achieve 80%	examinations	
work	application of		These data were	across on of the		
	advanced laboratory		compiled across	three unit exams		
	practices		three examinations	but upon retake		
			regarding the LO4.	they earned the		
				required 80%		
				grade		

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
	Measure 2: A series	Measure 2: 100%	Measure 1: 100%	Measure 2: All	Measure 2: No		
	of homework	of students will	of students	students were able	changes are		
	assignment (n=18)	complete the	completed all	to apply common	needed to these		
		assignment and	homework	laboratory	assignments		
		interpret their	assignments and	mathematical			
		findings	either interpreted	calculations and			
			their findings	understand their			
			correctly or	results			
			understood where				
		N 2 1000/	they made an error				
	Measure 3: Two	Measure 3: 100%	Measure 3: 100%	Measure 3: All	Measure 3: No		
	problem based	of students will	of students scored	students were able	changes are		
	practical	score at least 80%	all 80% of Detter	to apply advanced	needed to these		
	examinations	on the practical	(range: 85-100)	to prostical	practical exams		
		exam		situations			
Learning Outcome 5:	Maggura 1: Ona	Maggura 1. 100%	Maggura 1: 100%	Massure 1. All	Maasura 1. No		
Gather additional	unit problem based	of students will	of students scored	students were able	changes are		
laboratory data and	practical	score at least 80%	an 80% or better	to apply advanced	needed to these		
apply problem solving	examination	on the practical		laboratory theory	practical exams		
skills to solve	(specifically values	exam		to practical	pructicui exuitis		
problems/discrepancies.	on the low end of	Unum		situations			
	linear range			51000010110			
	appeared to be						
	suitable until the						
	examination of bias						
	plots)						

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 6:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Relate laboratory	Research article	of students must	of students	students were able	changes are		
findings to common	critique assignment	demonstrate	demonstrated an	to interpret and	needed to this		
disease.	(students select a	adequate	ability to	explain the crucial	assignment		
	primary research	presentation and	communicate a	methods, results,			
	article to present to	written skills to	critical	and conclusions of			
	the class, often	convey critical	examination of a	their selected			
	contain clinically	findings,	primary research	research article			
	relevant laboratory	conclusions, and	article.	and understand			
	data and disease	critiques		how their			
	characterizations)			laboratory results			
				to the conclusions			
				to the conclusions			
Learning Outcome 7:	This is a theory and	ΝΔ	ΝΔ		ΝΑ		
Demonstrate	application based	INA	INA	INA	INA		
professional conduct	course that does not						
and ethical behavior	focus or 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 able	changes are		
communication skills	critique	demonstrate	demonstrated an	to interpret and	needed to this		
and behaviors with		adequate	ability to	explain the crucial	assignment		
colleagues in the		presentation and	communicate a	methods, results,	_		
program and in the		written skills to	critical	and conclusions of			
laboratory		convey critical	examination of a	their selected			

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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
		findings,	primary research	research article			
		conclusions, and	article.	and understand			
		critiques		how their			
				laboratory results			
				did or did not lead			
				to the conclusions			
				the authors made.			

** 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: 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 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.

WSU Year 5 Interim Report

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 1:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Demonstrate	of 10 multiple	of students will	of students scored	students	curricular or		
knowledge of theory	choice questions	score 80% or better	80% or better on	successfully	pedagogical		
underlying laboratory	from Exam 1 and	on 10 questions	10 questions	demonstrated	changes needed at		
testing using analytical,	Quiz 1			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	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Apply mathematical	of 20 multiple	of students will	of students scored	students	curricular or		
calculations to	choice questions	score 80% or better	80% or better on	successfully	pedagogical		
laboratory situations.	from Exams 2 and	on 20 questions.	20 questions.	applied	changes needed at		
	Final Exam			mathematical	this time		
				calculations to			
				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	needed at this time		
	laboratory	mathematical	performed	mathematical			
	mathematical	calculations in	mathematical	calculations in			
	calculations		calculations in				

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

	Evid	ence of Learning: Cou	rses within the Major		
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*				
		laboratory	laboratory	laboratory	
		situations.	situations.	situations.	
Learning Outcome 3:	Measure 1: A set	Measure 1: 100%	Measure 1: 96%	Measure 1: All	Measure 1: No
Perform laboratory	of 20 multiple	of students will	of students scored	students	curricular or
procedures from simple	choice questions	score 80% or better	80% or better on	successfully	pedagogical
to complex, including	from Exams 1 and	on 20 questions	20 questions.	demonstrated	changes needed at
specimen collection	2 related to			knowledge of	this time
and processing,	performance of			evaluating	
analysis, interpretation,	laboratory			specimen	
and use of quality	procedures,			acceptability and	
assurance procedures.	specimen			optimal analysis	
	collection and			methods.	
	processing,				
	analysis, and QA.				
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	Demonstrate	of students will	of students were	students correctly	clinical changes
	proper knowledge	correctly determine	able to correctly	determined proper	needed at this time
	of specimen	proper sample	determine proper	sample suitability.	
	criteria in a blood	suitability.	sample suitability		
	bank laboratory	Students to	for blood bank		
	setting.	perform QC on all	analysis. QC		
		blood bank	results accurate.		
		reagents			
Learning Outcome 4:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Correlate laboratory	of 20 multiple	of students will	of students scored	students	curricular or
theory and terminology	choice questions	score 80% or better	80% or better on	successfully	pedagogical
		on 20 questions.	20 questions	correlated	

	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	Findings	Results**		
		Student Learning	Outcomes	_			
Students will	Direct and Indirect						
	Measures*						
to practical laboratory	from Exams 1 and			laboratory theory	changes needed at		
work	2.			and terminology to	this time		
				practical			
				laboratory work.			
	Measure 2: Assess	Measure 2: 100%	Measure 2: 99% of	Measure 2: Most	Measure 2: No		
	unknowns with	of students will	students scored	students performed	clinical changes		
	accuracy during 2	score 80% or better	80% or better on 2	the required skills	needed at this time		
	laboratory practical	on 2 laboratory	laboratory	during the 2			
	exams	practical exams	practical exams.	laboratory			
				practical exams.			
Learning Outcome 5:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Gather additional	of 20 multiple	of students will	of students scored	students	curricular or		
laboratory data and	choice questions	score 80% or better	80% or better on	successfully	pedagogical		
apply problem-solving	from Exams 2 and	on 20 questions.	20 questions.	demonstrated	changes needed at		
skills to solve	3.			problem solving	this time		
problems/discrepancies.				skills			
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	Students resolve	of students will	of students were	students correctly	clinical changes		
	discrepancies in	correctly resolve	able to correctly	resolved	needed at this time		
	the 11 laboratory	discrepancies in	resolve	discrepancies in			
	sessions and must	the 11 laboratory	discrepancies in	the 11 laboratory			
	correlate patient	sessions and	the 11 laboratory	sessions and			
	history to	correlate patient	sessions and	correlated patient			
	laboratory findings	history to	correlate patient	history to			
		laboratory findings	history to	laboratory findings			
			laboratory findings				

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 6:	Measure 1: A set	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Relate laboratory	of 25 questions	of students will	of students scored	students correctly	curricular or		
findings to common	from Exams 2, 3,	score 80% or better	80% or better on	related laboratory	pedagogical		
disease.	and the Final Exam	on 25 questions.	25 questions	findings to	changes needed at		
				common diseases.	this time		
	Measure 2: In 2	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No		
	laboratory sessions	of students will	of students were	students correctly	clinical changes		
	students relate	perform the	able to relate	related laboratory	needed at this time		
	laboratory findings	required skills in	laboratory findings	findings to			
	to common	the laboratory	to common	common diseases.			
	diseases		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	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	compliance with	needed at this time		
	code and safety	code and safety	dress code and	dress code and			
	procedures	procedures.	safety procedures	safety procedures.			
Learning Outcome 8:	Measure 1: 3 Essay	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No		
Demonstrate effective	questions on exam	of students will	of students were	students were able	curricular or		
communication skills	3.	score 80% or better	able to	to communicate	pedagogical		
and behaviors with		on essay questions.	communicate their	their knowledge on	changes needed at		
colleagues in the				the essay questions	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
program and in the			knowledge on the			
laboratory			essay questions			
	Measure 2:	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No	
	Affective Domain	of students will	of students	students can	clinical changes	
	Assessment in	receive	communicate	communicate	needed at this time	
	laboratory	"satisfactory"	effectively in the	better as the course		
	measuring	marks on Affective	group setting	progresses		
	communication	Domain				
	skills.	Assessment				
		measuring				
		communication				
		skills.				

** 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 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.
WSU Year 5 Interim Report

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	Findings	Results**
		Student Learning	Outcomes		
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	80% or better on	successfully	pedagogical
underlying laboratory	hematology	better on exams,	both exams.	demonstrated	changes needed at
testing using analytical,	testing. The Unit 5	proving		theory underlying	this time
interpretive, and	exam tests the	competency. If		laboratory testing	
problem-solving skills.	principles of	they do not score			
	hemostasis testing.	above 80%, they			
	50 multiple choice	are required to			
	questions each.	score well on a			
		retake 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.			
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	80% or better on 8	successfully	pedagogical
laboratory situations.	mathematical	better on these	questions.	applied	changes needed at
	calculations in	questions.		mathematical	this time
	exam 1, 2 and 5			calculations to	

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

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
				laboratory			
				situations.			
	Measure 2:	Measure 2: >90%	Measure 2: 100%	Measure 2: 100%	Measure 2: No		
	Laboratory	of students will	of students	of students	clinical changes		
	sessions requiring	correctly perform	correctly	correctly	needed at this time		
	applications of	mathematical	performed	performed			
	laboratory	calculations in	mathematical	mathematical			
	mathematical	laboratory	calculations in	calculations in			
	calculations	situations.	laboratory	laboratory			
			situations.	situations.			
Learning Outcome 3:	Measure 1: 50	Measure 1: >90%	Measure 1: 95%	Measure 1: 95%	Measure 1: No		
Perform laboratory	multiple choice	of students will	of students scored	of students	curricular or		
procedures from simple	questions from	score >80% on 60	80% or better on	successfully	pedagogical		
to complex, including	Exam 1 and 10	questions	20 questions.	demonstrated	changes needed at		
specimen collection	multiple choice			knowledge of	this time		
and processing,	questions from			evaluating			
analysis, interpretation,	Exam 5			specimen			
and use of quality				acceptability and			
assurance procedures.				optimal analysis			
				methods.			
	Measure 2:	Measure 2: >90%	Measure 2: >95%	Measure 2: All	Measure 2: No		
	Demonstrate	of students will	of students were	students correctly	clinical changes		
	proper knowledge	correctly	able to correctly	determined proper	needed at this time		
	of specimen	determine proper	determine proper	sample suitability.			
	criteria in a	sample suitability.	sample suitability				
	hematology		for hematology				
	laboratory setting		analysis				

	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	Findings	Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
Learning Outcome 4:	Measure 1: 50	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No		
Correlate laboratory	multiple choice	of students will	of students scored	of students	curricular or		
theory and terminology	questions each	score 80% or	80% or better on	successfully	pedagogical		
to practical laboratory	from exams 2, 3,	better on all	20 questions	correlated	changes needed at		
work	and 4	questions.		laboratory theory	this time		
				and terminology to			
				practical laboratory			
				work.			
	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	80% or better on	performed the	needed at this time		
	from a wide variety	better on the	the laboratory	required skills			
	of disorders during	laboratory	practical exam and	during the			
	6 laboratory	practical exam and	participated in all	laboratory practical			
	sessions. Assess	participate in all	required laboratory	exam and required			
	competency during	required laboratory	sessions.	laboratory			
	1 laboratory	sessions.		sessions.			
	practical exam						
Learning Outcome 5:	Measure 1: A set	Measure 1: >90%	Measure 1: >95%	Measure 1: >95%	Measure 1: No		
Gather additional	of 15 multiple	of students will	of students scored	of students	curricular or		
laboratory data and	choice questions	score 80% or	80% or better on	successfully	pedagogical		
apply problem solving	from Exams 1 and	better on 20	20 questions.	demonstrated	changes needed at		
skills to solve	5	questions.		problem solving	this time		
problems/discrepancies.				skills			

	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
	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	correlate patient	patient history and		
	laboratory findings	diagnoses to	history and	diagnoses to		
	in 6 laboratory	laboratory findings	diagnoses to	laboratory findings		
	sessions	in 6 laboratory	laboratory findings	in 6 laboratory		
		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	score 80% or	80% or better on	correctly related	pedagogical	
disease.	from exams 2, 3,	better on 50	50 multiple choice	laboratory findings	changes needed at	
	and 4, and 25	multiple choice	questions each	to common	this time	
	questions from	questions each	from exams 2, 3,	diseases.		
	exam 5.	from exams 2, 3,	and 4, and 25			
		and 4, and 25	questions from			
		questions from	exam 5.			
		exam 5.	2 1000/			
	Measure 2: In 6	Measure 2: >90%	Measure 2: 100%	Measure 2: >95%	Measure 2: No	
	laboratory sessions	of students will	of students were	of students	clinical changes	
	students relate	perform the	able to relate	correctly related	needed at this time	
	laboratory findings	required skills in	laboratory findings	laboratory findings		
	to common	the laboratory	to common	to common		
	diseases		diseases.	diseases.		

	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	Findings	Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 7:	Measure 1:	Measure 1: >95%	Measure 1: 100%	Measure 1: >95%	Measure 1: No	
Demonstrate	Attendance and	of students will	attendance in	of students	curricular or	
professional conduct	punctuality	attend laboratory	laboratory section.	attended laboratory	pedagogical	
and ethical behavior	expectations	section and be	>95% punctuality	section and most	changes needed at	
	defined in course	punctual.		were punctual	this time	
	syllabus					
	Measure 2:	Measure 2: >95%	Measure 2: 100%	Measure 2: >95%	Measure 2: No	
	Adherence to	of students will	of students	of students were in	clinical changes	
	laboratory dress	comply with dress	complied with	compliance with	needed at this time	
	code and safety	code and safety	dress code and	dress code and		
	procedures	procedures.	safety procedures	safety procedures.		
Learning Outcome 8:	Measure 1:	Measure 1: >95%	Measure 1: >95%	Measure 1: >95%	Measure 1: No	
Demonstrate effective	Laboratory	of students will be	of students were	of students	curricular or	
communication skills	etiquette and	punctual to	punctual to	demonstrated	pedagogical	
and behaviors with	expectations are	laboratory	laboratory	effective	changes needed at	
colleagues in the	defined in the	sessions, and	sessions, and	communication	this time	
program and in the	syllabus. Measured	remain task-	remained task-	skills through		
laboratory	by punctuality and	oriented	oriented	punctuality and		
	participation.	throughout the	throughout the	tasks during		
		session in order to	session and	laboratory		
		receive full	received full	sessions.		
		participation	participation			
		credit.	credit.			

** 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 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.

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

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
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
				laboratory	
				mathematics.	
	Measure 2: Graded	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:
	laboratory	students must	students with	students with	Findings indicate
	exercises, which	correctly complete	passing grades	passing grades can	no changes are
	include	laboratory	earned at least	successfully	needed at this
	calculations.	calculations.	80% of the total	complete	time.
			points possible.	laboratory	
				mathematics.	
Learning Outcome 3:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:
Perform laboratory	Students will	students must	students with	students with	Findings indicate
procedures from simple	complete a	complete the	passing grades	passing grades can	no changes are
to complex, including	laboratory project	laboratory with a	earned a score of at	successfully	needed at this
specimen collection	that includes	score of at least	least 80%.	complete	time.
and processing,	several exercises	80%.		laboratory testing	
analysis, (CONT)	ranging in			procedures ranging	
interpretation, and use	difficulty.	M	M	In difficulty.	M
of quanty assurance	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:
procedures.	Demonstrate	Students will	students with	students can assess	Findings indicate
	knowledge of	assess samples	passing grades	samples for testing	no changes are
	requirements and	sublitted for	damonstrated	as appropriate.	time
	action	lesung for	knowledge of		ume.
	procedures	acceptability.	sample		
	procedures.		sample		
			requirements.		

	Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes	-		
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1:	
Correlate laboratory	Students will	Students will	students with	students with	Findings indicate	
theory and terminology	correlate theory	complete all	passing grades	passing grades can	no changes are	
to practical laboratory	and terminology in	laboratory	earned a score of at	correlate theory to	needed at this	
work	all laboratory	correlation	least 80%.	practical laboratory	time.	
	exercises.	activities with a		situations.		
		score of at least				
		80%.				
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Students must	Students must	students with	students with	Findings indicate	
	complete the	complete the	passing grades	passing grades can	no changes are	
	verification	verification with at	earned a score of at	correlate theory to	needed at this	
	exercise that	least 80%.	least 80%.	laboratory	time.	
	requires			situations.		
	knowledge of					
	theory.					
Learning Outcome 5:	Measure 1:	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:	
Gather additional	Students will	students must pass	students with	students with	Findings indicate	
laboratory data and	evaluate a	the panel exam	passing grades	passing grades are	no changes are	
apply problem solving	collection of tests	with at least 80%.	earned a score of at	able to correlate	needed at this	
skills to solve	to identify		least 80%.	multiple results for	time.	
problems/discrepancies.	discrepancies.			the identification of		
				erroneous entries.		

	Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
	Measure 2: The	Measure 2: All	Measure 2: All	Measure 2: All	Measure 2:	
	laboratory	Students must	students with	students with	Findings indicate	
	verification	correct	passing grades	passing grades are	no changes are	
	exercise will	discrepancies in	earned a score of at	able to identify and	needed at this	
	require the students	order to report out	least 80%.	correct	time.	
	to troubleshoot	verification results		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	the student's	the exam with a	passing grades	passing grades can	no changes are	
disease.	ability to correlate	score of at least	earned a score of at	accurately correlate	needed at this	
	laboratory findings	80%.	least 80%.	laboratory findings	time.	
	to common			to common		
	diseases.			diseases.		
(CONT)	Measure 2: Class	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	assignments will	Students must	students with	students with	Findings indicate	
	require the students	identify laboratory	passing grades	passing grades can	no changes are	
	to understand	results that are not	have accurately	correlate laboratory	needed at this	
	disease states in	consistent with	correlated	findings to disease	time.	
	order to determine	patient diagnoses.	laboratory findings	states covered in		
	if the results are		on assigned	the course.		
	acceptable.		activities.			
Learning Outcome 7:	Measure 1: The	Measure	Measure 1: All	Measure 1: All	Measure 1:	
Demonstrate	final exam contains	1:Students must	students with	students with	Findings indicate	
professional conduct	30 questions that	pass the test with a	passing grades	passing scores have	no changes are	
and ethical behavior				an introductory		

	Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
	cover professional	score of at least	scored at least 80%	understanding of	needed at this	
	behavior.	80%.	on the test.	professional	time.	
				behavior.		
	Measure 2:	Measure 2:	Measure 2: All	Measure 2: All	Measure 2:	
	Adherence to	Students must	students with	students with	Findings indicate	
	proper laboratory	comply with dress	passing grades	passing grades are	no changes are	
	dress code and	code requirements	properly gowned	aware of proper	needed at this	
	common	for OSHA and	laboratory clothing	laboratory attire	time.	
	regulatory	HIPAA	(i.e. lab coat) and	and HIPAA		
	requirements (i.e.	requirements.	showed	regulations that are		
	HIPAA)		compliance to	discussed.		
			HIPAA regulations			
			they were exposed			
			to.			
Learning Outcome 8:	Measure 1: The	Measure 1: All	Measure 1: All	Measure 1: All	Measure 1:	
Demonstrate effective	verification	verification and	students with	students with	Findings indicate	
communication skills	exercise requires	validation	passing grades	passing grades	no changes are	
and behaviors with	the students to	activities but earn	earned at least	have shown	needed at this	
colleagues in the	submit a validation	a grade of at least	80% on the	appropriate written	time.	
program and in the	plan and an	80%.	verification and	communication		
laboratory	executive		validation	skills.		
	summary.		exercises.			
	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	
				importance of	time.	

Evidence of Learning: Courses within the Major								
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use			
Goal	Measurement	Evidence of	Learning	Findings	of Results**			
		Student Learning	Outcomes					
Students will	Direct and Indirect							
	Measures*							
	interactions	outlined in the	appropriately with	prompt and				
	amongst peers.	course syllabus.	their colleagues.	professional				
				interaction.				

** 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 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.

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

	Evidence of Learning:	Courses within the Ma	jor: MLS 4409
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Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
and processing,	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No
analysis, interpretation,					clinical changes
and use of quality					needed at this time
assurance procedures.					
Learning Outcome 4:	Measure 1:	Measure 1: The	Measure 1: This	Measure 1:	Measure 1:
Correlate laboratory	Students must	threshold for	course serves as a	Students increase	Because of these
theory and terminology	view pre-recorded	evidence of student	capstone to link	their knowledge	results, and
to practical laboratory	lectures and take a	learning is 80% for	the previously-	and empathy	student preference,
work	quiz each week***	the overall quiz	learned learning	toward patients and	more student-
	-	grade***	objectives from	disease***	directed cases
			multiple		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
	appropriately	demonstrate a	students to link	greater	been placed to
	present a case that	pathophysiologic	previously learned	understanding of	ensure that the
	provides a teaching	mechanisms and	outcomes and	the application of	students teach a
	point and include	testing	testing	the didactic	practical
	findings from 2	interferences	interferences with	knowledge and	application of
	areas of the lab***	learned in the	actual	deeper	testing during
		program***	pathologies***	understanding ***	their case

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
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					this time
problems/discrepancies.	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No
					clinical changes
					needed at this time
Learning Outcome 6:	Measure 1:	Measure 1: The	Measure 1: This	Measure 1:	Measure 1: No
Relate laboratory	Students must take	threshold for	course serves as a	Students can easily	curricular or
findings to common	a quiz on the	evidence of student	capstone to link	correlate their	pedagogical
disease.	weekly lecture	learning is 80% for	the previously-	laboratory findings	changes needed at
	video***	the overall quiz	learned learning	with disease	this time
		grade***	objectives from	states***	
			multiple courses		

	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No
					clinical changes
					needed at this time
Learning Outcome 7:	Measure 1:	Measure 1: 100%	Measure 1: 95%	Measure 1: Most	Measure 1: No
Demonstrate	Attendance and	of students will	punctuality	students were	curricular or
professional conduct	punctuality	attend and be		punctual	pedagogical
and ethical behavior	expectations	punctual.			changes needed at
	defined in course				this time
	syllabus				

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	Measure 2:	Measure 2:	Measure 2: A	Measure 2:	Measure 2: No
	Observation of an	Presenting an	requirement in the	Students gained	clinical changes
	educational case	educational case to	presentation	confidence in their	needed at this time
	presentation***	the class***	assignment is to	presentation skills	
			include 2 different	and	
			areas of the lab	clinicopathologic	
			that give practical	correlation***	
			application***		
Learning Outcome 8:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1: Began
Demonstrate effective	Observation of	Effectively shared	Inclusion of 2	Students gain	having students
communication skills	conveyance of	appropriate	previously learned	appropriate	present cases for
and behaviors with	appropriate	knowledge with	learning outcomes	knowledge when	their learning
colleagues in the	knowledge***	the class***	from 2 sections of	presenting	
program and in the			the lab is	cases***	
laboratory			required***		
	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: ***	Measure 2: No
					curricular or
					pedagogical
					changes needed at
					this time

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*** 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.

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 University, 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.

	Evide	ence of Learning: Cou	rses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
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
	laboratory data	laboratory data	correlate the	laboratory data	time
	with the patient's	with the patient's	laboratory data	with the patient's	
	clinical condition	clinical condition.	with the patient's	clinical condition.	
	in 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	
			and in	and in	

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
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
	interprofessional	interprofessional	interprofessional	interprofessional	
	simulation.	simulation.	simulation.	simulation.	
Learning Outcome 3:	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Perform laboratory	(This course does				
procedures from simple	not have a				
to complex, including	laboratory				
specimen collection	component.)				
and processing,					
analysis, interpretation,					
and use of quality					
assurance procedures.					
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: No
Correlate laboratory	Students will	Students will solve	Students solved the	students	curricular or
theory and terminology	accurately correlate	the	multidisciplinary	successfully	pedagogical
to practical laboratory	laboratory theory	multidisciplinary	case studies with	correlated	changes needed at
work	and utilize the	case studies by	100% accuracy.	laboratory theory	this time
	terminology to	applying		and terminology to	
	solve	knowledge of		the practical	
	multidisciplinary	laboratory theory		laboratory work	
	case studies.	and terminology		presented in the	
		with 100%		multidisciplinary	
		accuracy.		case study.	
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: No
Gather additional	Students will work	Students will	Students solved the	students	curricular or
laboratory data and	in groups to	correctly identify	multidisciplinary	successfully	pedagogical
apply problem-solving	brainstorm	additional	case studies with	identified	changes needed at
	additional	laboratory data	100% accuracy.	additional	this time

	Evide	ence of Learning: Cou	rses within the Major		
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
skills to solve	laboratory data	required to		laboratory data	
problems/discrepancies.	required to	correctly solve the		required and	
	correctly solve the	multidisciplinary		demonstrated	
	multidisciplinary	case studies.		problem solving	
	case studies.			skills necessary to	
				resolve the	
				multidisciplinary	
				case studies.	
Learning Outcome 6:	Measure 1:	Measure 1:	Measure 1: 100%	Measure 1: All	Measure 1: No
Relate laboratory	Students relate	Students will relate	of students were	students correctly	clinical changes
findings to common	laboratory findings	laboratory findings	able to relate	related laboratory	needed at this
disease.	to common	to the disease	laboratory findings	findings to	time
	diseases in the	states presented in	to common	common diseases.	
	multidisciplinary	the case study and	diseases.		
	case study and	IPE activity with			
	simulated	100% accuracy.			
	interprofessional				
	education (IPE)				
	activity.				
Learning Outcome 7:	Measure 1:	Measure 1:	Measure 1:	Measure 1: All	Measure 1: No
Demonstrate	Attendance,	Students will	Students attended	students attended	curricular or
professional conduct	punctuality, and	attend regular	regular course	the sessions with	pedagogical
and ethical behavior	professional/ethical	course offerings,	offerings with	>90% attendance	changes needed at
	expectations	be punctual, and	>90% attendance	and most were	this time
	defined in course	demonstrate	and punctuality.	punctual	
	syllabus	professional/	No issues related		
		ethical behavior	to unprofessional		

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

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

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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					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
Learning Outcome 1:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: All	Measure 1: No
Demonstrate	Student research	of student groups	of student groups	students were able	curricular or
knowledge of theory	groups develop a	will develop a	developed a	to define a clear	pedagogical
underlying laboratory	research question /	research question	research question	hypothesis and	changes needed at
testing using analytical,	hypothesis related	relating to MLS	relating to MLS	outline a research	this time; however
interpretive, and	to MLS and write a	and also develop	and also developed	proposal for the	we are always
problem solving skills.	grant detailing the	methods to address	methods to address	next year detailing	critiquing the
	experimentation	the research	the research	their experimental	grants produced
	needed to test their	question	question	approaches and	by the students to
	hypothesis.			expected results.	improve the
					likelihood of
					obtaining funding.
Learning Outcome 2:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure 1: The	Measure 1: No
Apply mathematical	Student groups	of student groups	of student groups	students have	curricular or
calculations to	identify	will identify	identified	achieved the	pedagogical
laboratory situations.	appropriate	appropriate	appropriate	learning outcome	changes needed at
	statistical	statistical	statistical	by defining the	this time
	calculations to be	calculations to be	calculations to be	statistical	
	used in analyzing	used in analyzing	used in analyzing	calculations they	
	data to be	data to be collected.	data to be	intend to use.	
	collected.		collected.		
Learning Outcome 3.	Goal not	ΝΔ	ΝΔ	NΔ	ΝΔ
Perform laboratory	applicable to	147.7	11/1	1117	
procedures from simple	research class this				
procedures nom simple	researen etass tills				

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

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
to complex, including	semester because it				
specimen collection	is focuses on				
and processing,	generating a				
analysis, interpretation,	hypothesis, writing				
and use of quality	a research grant,				
assurance procedures.	and obtaining				
	funding for				
	experimentation in				
	the following				
	semester.				
Learning Outcome A	Maggung 1. During	Magguera 1, 1000/	Maggura 1, 1000/	Maggung 1. The	Maagura 1, No
Correlate laboratory	the process of	Measure 1: 100%	of students	students were able	Measure 1: No
theory and terminology	developing the	or students will	orrelated	draw on their	
to practical laboratory	research methods	theory and	laboratory theory	knowledge of the	changes needed at
work	students will	terminology to	and terminology to	clinical laboratory	this time
WOIK	correlate	determine the	determine the	and describe	uns une
	laboratory theory	appropriate	appropriate	detailed methods	
	and terminology to	tests/methodologies	experimental	to test their	
	determine what	required to	methodologies to	hypothesis	
	testing is required	experimentally test	use in their	nypoulosis.	
	to test their	their hypothesis	research plan		
	hypothesis		research prant		
Learning Outcome 5:	Goal not	NA	NA	NA	NA
Gather additional	applicable to this				
laboratory data and	research-based				
apply problem solving	course				

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes		
Students will	Direct and Indirect				
	Measures*				
skills to solve					
problems/discrepancies.					
Learning Outcome 6:	Goal not	NA	NA	NA	NA
Relate laboratory	applicable to this				
findings to common	research-based				
disease.	course				
Learning Outcome 7:	Measure 1:	Measure 1: 100%	Measure 1: 95%	Measure 1: Most	Measure 1: No
Demonstrate	Attendance and	of students will	attendance in class	students attended	curricular or
professional conduct	punctuality	attend class and be		class each week, a	pedagogical
and ethical behavior	expectations	punctual.		few had excuses	changes needed at
	defined in course			absences	this time
	syllabus				
	Measure 2: Obtain	Measure 2: 100%	Measure 2: 100%	Measure 2: All	Measure 2: No
	CITI certification	of students will	of students	students were able	clinical changes
	in Institutional	achieve at least an	achieved CITI IRB	to pass the seven	needed at this
	Review Board	80% on the seven	certification	training modules	time
	(IRB) training	CITI training		and earn the CITI	
		modules for IRB		certification	
		certification			
Learning Outcome 8:	Measure 1: 7	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	with scores above	assignments	writing proficiency	this time
	(e.g. abstract, grant	80% or better by		and that they could	

Evidence of Learning: Courses within the Major					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		Student Learning	Outcomes	_	
Students will	Direct and Indirect				
	Measures*				
program and in the	proposal, methods,	following		adequately	
laboratory	budget sheet)	directions and		communicate their	
		format (e.g. abstract		hypothesis,	
		and grant		methodological	
		guidelines)		approach, and	
				budget	
				justifications	
	Measure 2:	Measure 2: 100 %	Measure 2: 93% of	Measure 2: Most	Measure 2: No
	demonstrates	of students will	students	students were able	curricular or
	effective	demonstrate	demonstrated	to effectively	pedagogical
	communication	effective	effective	communicate in a	changes needed at
	and collaboration	communication and	communication	collaborative	this time
	within research	collaboration	and collaboration	fashion within	
	group and with	within research	within research	their research	
	research mentor	group and with	group and with	group and with	
		research mentor	research mentor	mentor; one	
				student did have an	
				unresolvable	
				conflict with their	
				group and needed	
				to be removed	
				from the project.	

** 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 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.

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

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

Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning Outcomes	Findings	of Results**	
		Student Learning				
Students will	Direct and Indirect					
	Measures*					
	will be applied to	will be able to	were able to apply	able to apply a	pedagogical	
	data collected for	apply the	formal statistical	unique set of	changes needed	
	hypothesis testing	appropriate	tests to asses and	statistical tests	at this time	
	(e.g. t-tests,	statistical test to	analyze their	appropriate for		
	ANOVA, linear	formally assess	experimental data	their project data		
	regression, etc.)	their data and test		and hypothesis/es		
		their 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	
to complex including	rescarsh matheda to	testing will be	testing was	were able to	pedagogical	
specimen collection	address research	identified research	identified research	laboratory testing	at this time	
and processing	question if	methods to address	methods to address	for the identified	at this time	
analysis interpretation	appropriate for	the identified	the identified	research methods		
and use of quality	research project	research methods to	research methods to	to test		
assurance procedures.	researen project	test hypothesis/es	test hypothesis/es	hypothesis/es		
Learning Outcome 4:	This outcome is not	NA	NA	NA	NA	
Correlate laboratory	applicable to this					
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	
	results and modify	results and modify	experimental	that required	at this time	

Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning Outcomes	Findings	of Results**	
		Student Learning				
Students will	Direct and Indirect					
	Measures*					
skills to solve	methods/procedures	methods/procedures	results and modify	troubleshooting or		
problems/discrepancies.	to ensure successful	to ensure successful	methods/procedures	optimizing their		
	experimentation	experimentation	to ensure successful	protocols		
			experimentation			
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	
	students will relate	common disease, if	appropriate for	they collected to	at 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,	curricular or	
professional conduct	punctuality	class and lab	groups attended the	analyzing, and	pedagogical	
and ethical behavior	expectations	sections to	designated class	disseminating	changes needed	
	defined in course	complete their	and lab sections, as	their research in	at this time	
	syllabus and	experiments on	well as complete	one semester is a		
	research contract	time	their	challenge, having		
	between students		experimentation on	the students stick		
			time	to a schedule		
				helps 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	curricular or	
	professionals at	groups will submit	groups were able to	groups presented	pedagogical	
	various local and	abstracts and be	submit abstracts	their posters at a	changes needed	
			and be accepted for	University	at this time	

Evidence of Learning: Courses within the Major						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning Outcomes	Findings	of Results**	
		Student Learning				
Students will	Direct and Indirect					
	Measures*					
	national	accepted for a	a poster	research		
	conferences	poster presentation	presentation	symposium and a		
				local medical		
				society meeting,		
				along with select		
				groups presenting		
				at one of two		
				national		
				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	
colleagues in the	writing proficiency	on 3 assignments	assignments	writing	at this time	
program and in the		with scores above		proficiency on		
laboratory		80% or better		groups		
				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	
	collaboration	communication and	communication and	collaborative	at this time	
	within research	collaboration	collaboration	tashion within		
	group and with	within research	within research	their research		
	research mentor	group and with	group and with	group and with		
		research mentor	research mentor	mentor		

WSU Year 5 Interim Report

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

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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.

	Evidence of Learning: MLS 4411						
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:	Measure 1: 100%	Measure 1: N/A	Measure 1: N/A	Measure 1: No		
Demonstrate	Participation in	of students will			curricular or		
knowledge of theory	Simulated Lab	participate in			pedagogical		
underlying laboratory	Sessions	simulated lab			changes needed at		
testing using analytical,		sessions and apply			this time		
interpretive, and		knowledge learned					
problem solving skills.		in the MLT					
		program					
	Measure 2:	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No		
	Recognition of				clinical changes		
	critical values				needed at this time		
Learning Outcome 2:	Measure 1:	Measure 1:	Measure 1: 100%	Measure 1: All	Measure 1: No		
Apply mathematical	Students will	Students rotating	of Students	students rotating	curricular or		
calculations to	calculate CBC	through	rotating through	through	pedagogical		
laboratory situations.	values from an	Hematology will	Hematology will	Hematology will	changes needed at		
	EDTA clumper	calculate CBC	calculate CBC	calculate CBC	this time		
	patient.	values from an	values from an	values from an			
		EDTA clumper	EDTA clumper	EDTA clumper			
		patient.	patient.	patient.			
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No		
					clinical changes		
			M 1 1000/	M 1 1000/	needed at this time		
Learning Outcome 3:	Nieasure 1:	Measure 1:	Measure 1: 100%	Measure 1: 100%	Measure I: No		
Periorm laboratory	Kolation through	Students Will	of students will	of students rotated	curricular or		
procedures from simple		rotate through each	rotate through each	urrougn each	pedagogical		

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

Evidence of Learning: MLS 4411						
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*					
to complex, including	all departments of	department:	department:	department:	changes needed at	
specimen collection	SIM lab	Processing, UA,	Processing, UA,	Processing, UA,	this time	
and processing,		serology, heme,	serology, heme,	serology, heme,		
analysis, interpretation,		Coag, Chem,	Coag, Chem,	Coag, Chem, blood		
and use of quality		blood bank and	blood bank and	bank and micro at		
assurance procedures.		micro at least one	micro at least one	least one week		
		week during the	week during the	during the		
		semester.	semester.	semester.		
	Measure 2: Weekly	Measure 2:	Measure 2: 100%	Measure 2: 90%	Measure 2: No	
	sample collection	Students will draw	of students will	drew blood each	clinical changes	
		blood each week	draw blood each	week.	needed at this time	
		for a total of 12	week for a total of			
		blood draws.	12 blood draws.			
Learning Outcome 4:	Measure 1:	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No	
Correlate laboratory	Students participate	students will	of students	students	curricular or	
theory and terminology	in mock CAP	review current	participated in	successfully	pedagogical	
to practical laboratory	inspection	CAP standards and	mock CAP	participated in	changes needed at	
work		prepare a	inspection and	mock CAP	this time	
		laboratory for	submitted a	inspection		
		inspection	deficiency report			
			to lab manager			
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No	
	Students will	students will	of students	students	clinical changes	
	calibrate laboratory	calibrate	calibrated	successfully	needed at this time	
	equipment	laboratory	laboratory	participated in		
				calibration studies		

Evidence of Learning: MLS 4411						
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*					
		equipment	equipment to lab			
		currently in use	manager standards			
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1: 100%	Measure 1: All	Measure 1: No	
Gather additional	Students will dilute	Students rotating	of students rotating	students rotating	curricular or	
laboratory data and	a critical glucose	through chemistry	through chemistry	through chemistry	pedagogical	
apply problem solving	value	will dilute a	diluted a critical	successfully	changes needed at	
skills to solve		critical glucose	glucose value	diluted a critical	this time	
problems/discrepancies.		value		glucose value		
	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%	Measure 1: No	
Relate laboratory	Participation in	Students will	of Students will	of participated in a	curricular or	
findings to common	blood bank SBAR	participate in a	participate in a	blood bank	pedagogical	
disease.	exercise.	blood bank	blood bank	exercise using the	changes needed at	
		exercise using the	exercise using the	SBAR technique	this time	
		SBAR technique	SBAR technique	for which they will		
		for which they will	for which they will	relate laboratory		
		relate laboratory	relate laboratory	findings to disease		
		findings to disease	findings 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	
Evidence of Learning: MLS 4411						
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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 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.			
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: 100%	Measure 2: No	
	Assessment of	students will be	of students will	of students	clinical changes	
	Telephone skills	assessed in proper	demonstrate	demonstrated	needed at this time	
		telephone skills.	proper telephone	proper telephone		
			skills.	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	participated in and	pedagogical	
and behaviors with		projects, each	team projects, with	managed the team	changes needed at	
colleagues in the		taking turns being	each taking a turn	for all projects	this time	
program and in the		the project	as project manager			
laboratory		manager				
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No	
	Evaluation and	student managers	of student	students completed	curricular or	
	participation in	will report on team	managers will	evaluations on	pedagogical	
	simulated lab	members skills and	report on team	team members on	changes needed at	
	sessions through	participation in	members skills and	team members	this time	
	completion of a	simulated lab	participation in	skills and		
	manager's	sessions.	simulated lab	participation in		
			sessions.			

Evidence of Learning: MLS 4411								
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*							
	checklist in SIM			simulated lab				
	lab.			sessions				

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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

Evidence of Learning: MLS 4412 Simulated Laboratory II						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 1:	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No	
Demonstrate					curricular or	
knowledge of theory					pedagogical	
underlying laboratory					changes needed at	
testing using analytical,					this time	
interpretive, and	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No	
problem solving skills.					clinical changes	
					needed at this time	
Learning Outcome 2:	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No	
Apply mathematical					curricular or	
calculations to					pedagogical	
laboratory situations.					changes needed at	
		Maaaaa 2. NI/A	Maaaa 2 N/A		this time	
	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2N/A	Measure 2: No	
					nooded at this time	
Learning Outcome 2.	Maagura 1. N/A	Maagura 1. N/A	Maaguma 1. N/A	Maaguma 1NI/A	Measure 1. No	
Derform laboratory	Measure 1: IN/A	Measure 1: N/A	Measure 1: IN/A	Measure IIN/A	measure 1. No	
procedures from simple					pedagogical	
to complex including					changes needed at	
specimen collection					this time	
and processing	Measure 2. N/A	Measure 2. N/A	Measure 2. N/A	Measure 2. N/A	Measure 2: No	
analysis interpretation			1010u5u10 2. 10/11		clinical changes	
and use of quality					needed at this time	
assurance procedures.					needed at this time	
1						

Evidence of Learning: MLS 4412 Simulated Laboratory II						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Learning Outcome 4:	Measure 1:	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No	
Correlate laboratory	Students	students will	of students	students	curricular or	
theory and terminology	participate in mock	review current	participated in	successfully	pedagogical	
to practical laboratory	CAP inspection	CAP standards and	mock CAP	participated in	changes needed at	
work		prepare a	inspection and	mock CAP	this time	
		laboratory for	submitted a	inspection		
		inspection	deficiency report			
			to lab manager			
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No	
	Students will	students will	of students	students	clinical changes	
	calibrate laboratory	calibrate laboratory		successfully	needed at this time	
	equipment	equipment	laboratory	participated in		
		currently in use	equipment to lab	calibration studies		
Learning Outcome 5:	Maggura 1: N/A	$M_{aacura} 1 \cdot N/\Lambda$	Manager Standards	$M_{aagura} 1 \cdot N/\Lambda$	Maagura 1: No	
Cather additional	Measure 1. IN/A	Measure 1. IN/A	Measure 1. IN/A	Measure 1. IN/A	curricular or	
laboratory data and					pedagogical	
apply problem solving					changes needed at	
skills to solve					this time	
problems/discrepancies.	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No	
prochemis, discrepancies.	1010u5u10 2. 10/11	1110u5u10 2. 11/11	1010u5u10 2. 10/11	1110u5u10 2. 11/11	clinical changes	
					needed at this time	
Learning Outcome 6:	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: No	
					curricular or	
					pedagogical	

	Evidence of Learning: MLS 4412 Simulated Laboratory II					
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use	
Goal	Measurement	Evidence of	Learning	Findings	of Results**	
		Student Learning	Outcomes			
Students will	Direct and Indirect					
	Measures*					
Relate laboratory					changes needed at	
findings to common					this time	
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: 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	participated in and	pedagogical	
and behaviors with		projects, each	team projects, with	managed the team	changes needed at	
colleagues in the		taking turns being	each taking a turn	for all projects	this time	
program and in the		the project	as project manager			
laboratory		manager				
	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	pedagogical	

Evidence of Learning: MLS 4412 Simulated Laboratory II							
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
	effective	evaluations on	evaluations on	team members for	changes needed at		
	communication	team members for	team 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				

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

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

	Evidence of Learning: MLS 4412						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
and processing,	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No		
analysis, interpretation,					clinical changes		
and use of quality					needed at this time		
assurance procedures.							
Learning Outcome 4:	Measure 1:	Measure 1: All	Measure 1: 100%	Measure 1: All	Measure 1: No		
Correlate laboratory	Students	students will	of students	students	curricular or		
theory and terminology	participate in mock	review current	participated in	successfully	pedagogical		
to practical laboratory	CAP inspection	CAP standards and	mock CAP	participated in	changes needed at		
work		prepare a	inspection and	mock CAP	this time		
		laboratory for	submitted a	inspection			
		inspection	deficiency report				
			to lab manager				
	Measure 2:	Measure 2: All	Measure 2: 100%	Measure 2: All	Measure 2: No		
	Students will	students will	of students	students	clinical changes		
	calibrate laboratory	calibrate laboratory	calibrated	successfully	needed at this time		
	equipment	equipment	laboratory	participated in			
		currently in use	equipment to lab	calibration studies			
I. C. C. T			manager standards				
Learning Outcome 5:	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Measure 1: N/A	Nieasure 1: No		
Gatner additional					curricular or		
laboratory data and					pedagogical		
apply problem solving					changes needed at		
					this time		

	Evidence of Learning: MLS 4412						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
skills to solve	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: N/A	Measure 2: No		
problems/discrepancies.					clinical changes		
					needed at this time		
Looming Outcome 6:	Massura $1 \cdot N/\Lambda$	Massura $1 \cdot N/\Lambda$	Maggura $1 \cdot N/\Lambda$	Maggura $1 \cdot N/\Lambda$	Maggura 1: No		
Palata laboratory	Weasure 1. IN/A	Measure 1. N/A	Wiedsule 1. IN/A	Measure 1. IN/A	curricular or		
findings to common					pedagogical		
disease					changes needed at		
disease.					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		
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	participated in and	pedagogical		
and behaviors with		projects, each	team projects, with				

	Evidence of Learning: MLS 4412						
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use		
Goal	Measurement	Evidence of	Learning	Findings	of Results**		
		Student Learning	Outcomes				
Students will	Direct and Indirect						
	Measures*						
colleagues in the		taking turns being	each taking a turn	managed the team	changes needed at		
program and in the		the project	as project manager	for all projects	this time		
laboratory		manager					
	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	pedagogical		
	effective	evaluations on	evaluations on	team members for	changes needed at		
	communication	team members for	team 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				

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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	f Learning: Courses w	vithin the Major: MLS	4415	
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use
Goal	Measurement	Evidence of	Learning	Findings	of Results**
		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 able	proved to have	needed at this time
laboratory testing using	Management	80% or better to	to achieve 80% or	knowledge of	
analytical, interpretive,	theory Quiz	prove knowledge	higher competency	management	
and problem solving		and competency		theories	
skills.					
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 time
to complex, including	laboratory where	better attendance	TAs and achieved	demonstrated their	
specimen collection and	they can apply	to their assigned	90% or better	proficiency in	
processing, analysis,	previously learned	labs. Lab	attendance.	education and	
interpretation, and use	procedures in	instructors		training by	
of quality assurance	education and	evaluate their		assisting in	
procedures.	training and	performance using		laboratory	
	quality assurance.	a rubric.		teaching.	
			1		

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

Evidence of Learning: Courses within the Major: MLS 4415									
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use				
Goal	Measurement	Evidence of	Learning	Findings	of Results**				
		Student Learning	Outcomes						
Students will	Direct and Indirect								
	Measures*								
Learning Outcome 7:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:				
Demonstrate	Attendance and	Students will	The majority of	Students attended	No changes				
professional conduct	punctuality	attend class	students attended	class sessions and	needed at this time				
and ethical behavior	expectations	section and be	class sessions	most were					
	defined in course	punctual.	unless previously	punctual. They					
	syllabus.		excused	demonstrated					
				professional					
				conduct and ethical					
				behavior.					
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:				
	Students will listen	Students will	The majority of	Students attended	No changes				
	to a guest speaker	attend and	students attended	and participated in	needed at this time				
	on resume writing	participate in a	and participated in	a resume critique					
	and critique each	resume critique	a resume critique	exercise. They					
	other's resumes.	exercise where	exercise where	demonstrated					
		they will review 3	they reviewed 3 of	protessional					
		of their	their classmates'	conduct and ethical					
		classmates'	resumes.	behavior.					
		resumes.							

Evidence of Learning: Courses within the Major: MLS 4415									
Measurable Learning	Method of	Threshold for	Findings Linked to	Interpretation of	Action Plan/Use				
Goal	Measurement	Evidence of	Learning	Findings	of Results**				
		Student Learning	Outcomes						
Students will	Direct and Indirect								
	Measures*								
Learning Outcome 8:	Measure 1:	Measure 1:	Measure 1: The	Measure 1:	Measure 1:				
Demonstrate effective	Students will listen	Students will	majority of	Students were able	No changes				
communication skills	to a guest speaker	participate as	participated in the	to apply	needed at this time				
and behaviors with	on interviewing	interviewer and	mock interviews	interviewing skills					
colleagues in the	skills and	interviewee in	and scored 80% or	previously learned					
program and in the	participate in mock	mock interview	higher in their peer	in class through					
laboratory	interviews.	exercise and score	evaluations	class lectures and					
		80% or higher in		guest speakers					
		peer evaluations.							
	Measure 2:	Measure 2:	Measure 2:	Measure 2:	Measure 2:				
	Students	The majority of	The majority of	Students were able	No changes				
	participate in	students will	students	to correlate	needed at this time				
	online discussions	participate and	participated and	management					
	analyzing	score 80% or	scored 80% or	theory to real life					
	management case	better on all	better on all online	case study					
	studies scenarios	discussions.	discussions.	situations and					
	and applying the			management					
	management			scenarios.					
	concepts								
	previously learned.								

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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.