

## **Section 1 – Program Mission & Educational Objectives**

The mission of the Medical Laboratory Science Degree, a Bachelor of Science program, is to educate, train, and graduate professionally competent and ethical individuals, committed to life-long learning, and who are prepared to meet current and future workplace challenges in medical laboratory science.

### **Program Alignment to Oregon Tech Mission and Core Themes**

The goals of the Oregon Tech • OHSU MLS program are to:

1. Advance an innovative curriculum that meets current and emergent pedagogical and professional development needs of students.
2. Provide learning experiences rich in opportunities that maximize every student's potential to achieve MLS career entry-level competencies.
3. Graduate competent MLS that meet the workforce needs of Oregon and underserved regions of the nation.
4. Identify, establish, and maintain partnerships with community medical laboratories that provide exceptional educational experiences.
5. Contribute to the advancement of MLS pedagogy and growth of the profession.

### **Program Educational Objectives**

Upon completion of the Oregon Tech • OHSU MLS program, a student will have had the opportunity to acquire the knowledge and skills required to demonstrate professional attributes of a Medical Laboratory Scientist.

Successful completion of the program will allow students to pursue career opportunities in various laboratory settings including but not limited to medical, research and development, sales, management and public health.

At the time of graduation, graduates will have the knowledge needed to:

1. Competently perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology and other emerging diagnostic venues.
2. Proficiently problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.
3. Participate actively in the development, implementation, and evaluation of test methods
4. Take Responsibility for analysis and decision-making.
5. Apply safety and governmental regulations and standards to medical laboratory practice.
6. Act with Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients.
7. Participate in Interpersonal and interdisciplinary communication interactions with members of healthcare teams, external relations, customer service and patients.
8. Apply knowledge of medical laboratory finance, operations, marketing, human resource management and educational methods.
9. Utilize information technology to effectively and accurately report laboratory-generated information.
10. Apply research design and practice principles to test development and validation.

## Section 2 – Program Description and History

### History and Locations

Established in 1933 by the Oregon Health and Science University (OHSU) in Portland, Oregon, the nationally accredited\* Medical Laboratory Science program is a university-based, 3+1 program of study culminating in a BS in Medical Laboratory Science. In 2001, administrative responsibilities for the program transferred to Oregon Tech through a master collaboration agreement between the two universities. Student diplomas identify both Oregon Tech and OHSU as the degree-granting institutions. In brief, Oregon's only baccalaureate MLS program retains the brand identity of OHSU with the administrative support of Oregon Tech.

Today, the program is administered through the Department of MLS which resides on the Oregon Tech Portland Metro campus located in Wilsonville Oregon. Here, students admitted to the last year of the degree program referred to as the "professional year" take coursework that combines a rigorous competency-based science curriculum combined with community-sponsored clinical training. During the first four terms of the professional year, students complete course work as a cohort in state-of-the-art classrooms that include two well-equipped laboratory classrooms, a smart high-tech lecture hall and an instrumentation room. Upon successful completion of the on-campus coursework, students are assigned to one or more program-affiliated laboratories to complete clinical training in the areas of chemistry, hematology, microbiology, blood bank and management. During the 16-week clinical training period, students spend 40 hours per week applying knowledge and skills to perform a wide variety of testing in an accredited medical laboratory and to further develop discipline-specific competency under supervision of clinical instructors working in the field. Currently, the Department of MLS maintains affiliations with accredited laboratories in Oregon, Washington, Nevada, Idaho, Colorado, Hawaii, Arizona and Alaska.

### Program Changes

Changes that occurred in 2019 were felt by both graduating class of 2019 but most acutely by class of 2020. Beloved Microbiology Instructor Dustin Brown retired at the end of 2019. Class of 2019 enjoyed his support as both their instructor and their commencement speaker. Class of 2020 benefitted as his last class teaching Parasitology. The search for a microbiologist meant that the schedule of classes for class of 2020 academic year was upended. Blood Bank was moved to earlier in the course work structure in order to compensate for a lack of available Microbiology instruction. The new instructor Kristen Weber began in Spring term.

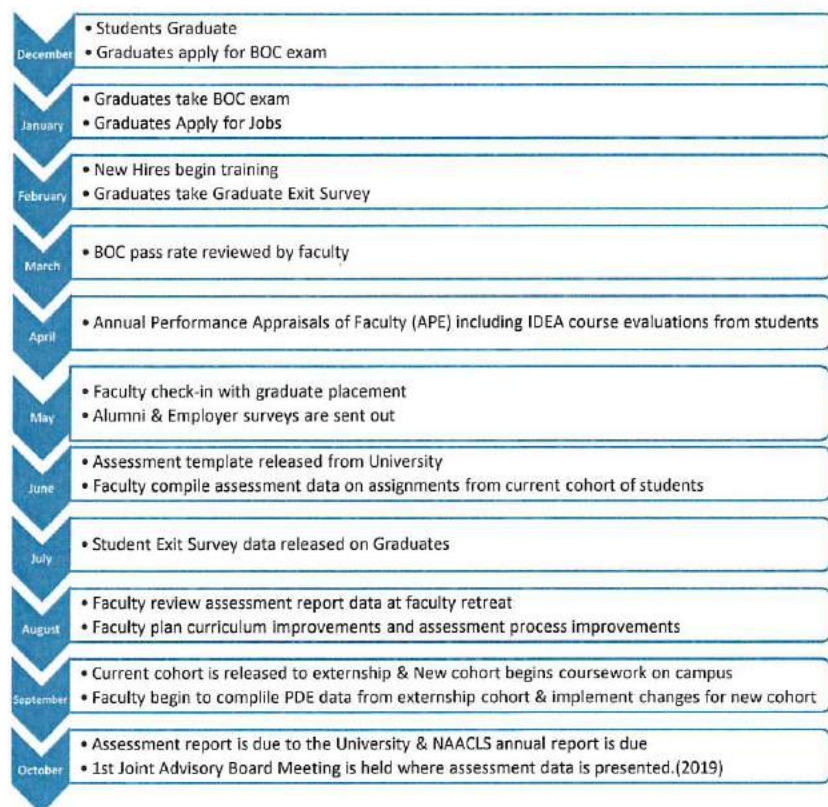
Due to the pandemic closures in 2020, instruction for all courses was delivered disjointedly, most acutely for the Microbiology series. A seasoned adjunct instructor Mary Hogan was brought in to teach the lecture for Microbiology I online while the new instructor was onboarded and developed online instruction for Microbiology II and the shortened Microbiology instruction for summer's 8-week delivery and labs. When students were brought back onto campus for labs only in summer term, students were participating in laboratories specific to lessons learned in Microbiology I while receiving online instruction for Microbiology II for the 8-week period. The summer term concluded and then was capped with an additional 4-week condensed Microbiology II bootcamp consisting of daily laboratory exercises meant to support the content learned in both Microbiology I and II. The 4-week boot camp period also contained a simulated laboratory experience in preparation for a shortened (9 weeks from 16 weeks) clinical externship experience. The externship was shortened because of COVID-19 restrictions on students at clinical sites. Laboratories for Urinalysis and Blood Bank were crammed into the 8-week summer term as well disjointed from their online lectures delivered during spring term. While Foundations of Laboratory Science was taught for the first-time during summer term.

At the end of this academic year's experience, instructors spent time examining their curriculum map to piece the program back together just as class of 2021 began. Both microbiology and foundations II were returned to winter term starts, while the blood bank series was set to begin in spring. It was decided that the simulated laboratory experience was a beneficial addition to student learning overall and will be kept in some format during the summer for class of 2021. Online instruction has remained a process for class of 2021, though instructors did learn that required attendance at mostly synchronous lectures on zoom is a better learning platform than entirely asynchronous course delivery.

While all of these changes cannot be readily apparent in the assessment data for class of 2019, class of 2020 has been a remarkably adaptive cohort but may demonstrate performance indicative of these stressors. Additionally, instructors were preparing for NAACLS accreditation by completing documentation of a self-study, a process last completed 7 years ago. Note: according to new standards the maximum accreditation is now 10 years. This process began summer of 2019 and ended Fall 2020. An accreditation site visit will be scheduled for spring 2021.

## Description of Assessment Plan

The assessment of the Medical Laboratory Science program follows a systematic process and timeline concluding with the preparation of this Assessment report that is published with the Office of Academic Excellence. The Medical Laboratory Science professional program is also accredited by the *National Accrediting Agency for Clinical Laboratory Science (NAACLS)*, 5600 North River Road, Suite 720, Rosemont, Illinois 60018-5119. NAACLS requires program assessment data to include certification results, graduation rates, employment rates, and attrition rates from the previous three years and participation in accreditation activities as published in the NAACLS standards. The Oregon Institute of Technology Medical Laboratory Science program has specified additional **Program Specific Learning Outcomes (PSLO)** based on the mission of the program for assessment to be included in this report as well. Student data providing evidence of progress on PSLOs must be included in this report both from the graduated class of the previous year and the class set to graduate within the year of the report. The classes supplying assignments that are utilized for data collection on each outcome are specified within the report and assigned on a rotating schedule. **Continuous Process Improvements** and changes to assessment process made by faculty based on assessment data must be documented within the report. Data collection and other assessment activities follow the annual schedule pictured in the figure below.



This report contains complete data from graduating class of **2019** both for NAACLS accreditation standards and PSLO measurement. Data from class of 2019 is compared against data provided by the previous 3-5 graduating classes in order for faculty to view trends in program delivery over time. Data from class of 2020, still being gathered, is included preliminarily in this report to provide reference on progress with programmatic changes made during the previous assessment cycle. Faculty driven evaluation and improvement plans based on the 2019 data are documented here as a part of continuous process improvement of the program.

## NAACLS Accreditation Standards: Graduation Rate, Retention, Attrition, Employment

The Medical Laboratory Science program has consistently maintained one of the highest retention and graduation rates of any program at Oregon Tech, 99% graduation rate over the past five years. Yearly attrition has not been more than 1 or 2 students over the last ten years. These values have consistently been well within the minimum values expected for accreditation.

Satisfaction of student completion of the program and professionalism is judged at a higher level by student **Attrition, Graduation, and Placement** data. Faculty compare this data across cohorts to judge for trends in the difficulty of the program overall. The higher-level data available in Winter term is the first indicator to faculty that the job market may be taking a turn. When this higher-

level data is then evaluated in conjunction with data from **alumni survey, employer survey** and **student exit survey** responses available in spring, a full picture of student satisfaction and the satisfaction of employers with the students produced from the program emerges. Faculty then use this information to make decisions on program emphasis on specific professional behaviors in order to better prepare students for the workplace.

Graduate employment rate has held steady over the life of the program at 100% of graduates finding employment within 6 months of graduation. Over the past several assessment cycles, evaluation of student placement has begun to include location (within Oregon vs outside of Oregon) and hospital (whether or not students found employment at the clinical site they were assigned to for externship). This data has been a valuable recruitment tool for the program. In a typical year 80% of students report employment within three months of graduation and about 75% of graduates remain in Oregon with about 50% remaining at their clinical externship site. Placement at the clinical externship is a complex process designed to best fit student learning needs and likelihood of pursuing employment at the clinical site they are placed at.

## Enrollment

The campus program can accommodate laboratory experiences for a maximum cohort of 50 students. The admitted class size is limited by three factors: 1) externship site availability, 2) qualified applicant pool and 3) Job Market demand.

Though Oregon Tech maintains affiliations with more than 65 clinical laboratories, the actual availability of externships varies by year and department. Some sites do not take students every year due to staffing levels or budget constraints. Many clinical laboratories are consolidating testing to regional laboratories and thus do not provide opportunities for all learning required of our students while out on externship. Steps have been taken to further evaluate the job market in the region through surveys sent to externship affiliates. Based on the survey responses from 2019, the majority of laboratories (65%) expect to have between 1-5 vacancies over the next five years, less than one per year. However, the majority of laboratories (60%) also said that they would prefer to fill those vacancies with an MLS graduate. Given this data, it is apparent that our program is providing an essential service to the region, but our enrollment numbers should decrease with market demand decrease.

As demonstrated in the below table, the applicant pool has decreased over the last several years. In order to maintain a competitive learning environment, it is important to maintain strict standards for acceptable candidates into the program. Work being done to increase applications include communication with Oregon Tech marketing department, MLS program presence at community career fairs and science centered community events, program faculty participation in Pre-MLS programs at Oregon Tech, Clackamas Community College and Warner Pacific College. Collaborations have been established with the MLT and CLA programs in the state of Oregon in order to support the laboratory education of all learners and promote the professions of laboratory medicine.

This year special effort was spent at the high school recruitment level as faculty engaged directly with biology teachers in the public-school systems. Faculty also engaged the current class in recruitment activities by participating in a statewide ESL career event. More work should be done in the area of recruiting a class from diverse backgrounds. Faculty will plan to continue to participate in future ESL events in the state of Oregon.

Academic Year	# of Applications	New cohort fall term	Externship students registered for fall term – scheduled to graduate in December	# Graduated in December
2014-15	102	45 students	48 students	48
2015-16	93	49 students	45 students	45
2016-17	82	47 students	47 students	47
2017-18	77	46 students	47 students	47
2018-19	78	43 students	46 students	46
2019-20	56	40 students	42 students	42
2020-21	50	36 students	39 students	NA

## DIVERSITY

Examining graduation and retention by race, gender and Pell grant status, this program has an excellent retention from all backgrounds. Self-identified students of color have been retained in the program for the past 5 years at greater than 90%, likewise with Pell Grant recipients and first-generation individuals. Women which have made up the vast majority of students, have been in the upper 80% of retention.

Looking at admission data is where the diversity of the class is lacking. Students admitted to the program over the past several years have been between 60% and 65% white and greater than 65% female. Class of 2020 was the first year that women only made up 51% of the cohort, however the cohort persistently remains 66% white. Given that the Oregon 2020 census found that 84% of Oregon's population is white, this data is not unexpected. Further, Oregon census data found that 2% of Oregon's population identifies as Black, 4% identifies as Asian and 11% identifies as Latino. This breakdown is not represented in the cohorts graduated from the MLS program of which roughly 12% on average identify as Asian and 3-7% as Hispanic. Looking at class of 2020 specifically, 12% identify as Asian and 10% as Hispanic and the only Black woman admitted withdrew before beginning classes in Fall 2019. If the program is to be representative of Oregon's population, recruitment must be conducted both in the Latinix and Black communities. Given, retention data, it is expected that once students (even those of color) are admitted, this program will see them through to graduation.

## Board of Certification (BOC)

Program graduates are eligible to take the *American Society for Clinical Pathology (ASCP) Medical Laboratory Scientist (MLS)* national board certification examination or the *American Medical Technologists (AMT)* certification exams. The MLS program has held an above national certification passage rate over the last 10 years. Most OHSU/OIT graduates choose to become certified by ASCP BOC exam due to the large recognition it receives in the job market.

## Industry Relationships

Program faculty held a joint Advisory Board Meeting in conjunction with Portland Community College MLT program and Clackamas Community College CLA program in October 2019. The rationale being that members of industry clinical affiliates and the affiliated colleges may receive a more thorough feedback on job market and outlook if the programs coordinated resources. At the meeting, the job market in Oregon was discussed in detail in relation to the balanced necessity of competency requirements for MLT and MLS in the workplace. Affiliates were actively interested in the formation of an online MLS program at OIT. On follow-up survey, 94% said they thought a program would benefit the state and 90% would support an internal candidate seeking a degree completion from Oregon Tech. Also, of topic, the trends in Microbiology as a specialty department were touched upon but no conclusion was made from this meeting. See meeting minutes attached in appendix.

The program also sent out its **alumni survey** and **employer survey** in May of 2020. Results of those two surveys indicate that graduates of the program are highly regarded, 100% surveyed said they would hire a graduate of the program again and 83% surveyed rated recent students from the program of the same or better caliber than years before. Alumni surveyed rated their BOC preparation in the program as better than average in 95% of cases, 51% giving the program the top score possible. Regarding career preparation, 98% of alumni said that the program was above average in preparing them for their career 58% giving the top score possible. The top suggestions from both surveys for improvements to make to the program were on giving real life workflow scenarios to the students.

The program maintains contact with several vendors in the field of Medical Laboratory Science. Some contacts are alumni of the program, some are industry partners donating reagents or equipment to foster learning. Much support of the program has been provided through career panel, interview prep, and externship affiliation.

Staff and students are encouraged to actively become involved in the industry's professional organizations through continuing education events and meetings. Students have been invited to participate in the following industry provided events over the last year:

- Northwest Medical Laboratory Symposium
- American Society of Clinical Laboratory Science (ASCLS) state and national conferences
- Student Representative for the state chapter of ASCLS

This year the in-person continuing education event that would have been held on campus was cancelled due to pandemic. Students were invited to apply for professional program scholarships which were awarded via zoom call. Two students in class of 2020 received scholarships from the Oregon chapter of ASCLS, five students from the class of 2020 received national ASCLS scholarships.

The 2019-2020 students of the program were again participants in an interdisciplinary program at OHSU (IPE) that aims to increase communication between diverse medical professionals through group discussions of potential professional challenges under the headings of patient safety and ethics. In preparation, the New Student Orientation for the 2019-2020 cohort included extensive information about the profession and code of ethics as well as communication skills. Students actively participated during the school year in ethics and community-based activities with other medical professionals. Students comported themselves professionally in

representing the program and college. Even as the last meeting of interprofessional practice moved online. It was felt by students and faculty that this experience exemplified the educational outcome #7 "Participate in Interpersonal and interdisciplinary communication interactions with members of healthcare teams, external relations, customer service and patients." It was a worthwhile use of student academic time both professionally for them as individuals and for the profession of laboratory science.

Sadly, in 2020-2021 the OHSU IPE program has moved entirely online and thus reduced student interaction with other members of the health care team. Because of this, faculty have decided to withdraw class of 2021 from the activity to better conserve their academic time. When in person meetings are reestablished, this partnership will resume.

## Student Perspectives from Graduating Class of 2019

### Suggestions for improvements:

"I think we should have a review course before we go on externship. We cover so much material that it would be nice to have a refresher before we go to externship."

"[We should do a] Mock clinic and troubleshooting for all discrepancies that encounter in real clinic."

"A course on instrumentation, as working with instruments is a significant part of real-life work as an MLS."

### Other thoughts:

"Heme was wonderful. I really felt confident after completing the courses."

"The most valuable experience I had in the MLS program encompassed being in the lab. The hands-on experience practicing techniques is what's helped me most as I've entered the field."

"I was able to go into my rotation feeling confident that I could perform the tasks needed once I learned the individual workflow and I'm sure any future job I will have that same preparedness."

"Microbiology 1/2 and mycology were my favorite series of classes, they taught be the joys of being a clinical microbiologist. I also loved the blood bank series, amazing course on blood antigen genetics and blood utilization."

## Externship sites Perspectives from Graduating Class of 2019

The sentiment of our students being independent workers was really felt for the class of 2019 from our externship site surveys.

"I gave her the instructions and she completed the task with little to no supervision."

"She has all the intangibles required to succeed in our field. She helps unprompted and pays great attention to detail both which are very important."

"He came prepared every day and brought a positive energy every day."

"She learned quickly and has a natural understanding of laboratory workflow."

"She is a self-starter who willingly takes on all assigned tasks and looks for more to do."

"She is fluid in the department, taking over all testing as if she were already comfortable and accomplished."

### Section 3 – Program Student Learning Outcomes

From the published Program Educational Objectives developed by the program, specific and measurable learning objectives have been chosen by faculty for measurement in the Assessment cycle. All learning objectives are specifically listed in course syllabi and are measured annually. Assessment of the program's success in achieving its objectives is measured both by student progress on designated course work related to program specific student learning outcomes (PSLO) and the accreditation standards of Graduation rate, attrition, placement and Board Certification passage. Additionally, University established, Essential Studies Learning Outcomes (ESLO) are measured on a three-year cycle from student work product shared from each program.

#### Program Specific Student Learning Outcomes (PSLO)

For class of 2019, seven measurable program specific learning outcomes have been defined that encompass both the university standards (Communication, Inquiry & Analysis, Ethical reasoning, Teamwork, and Quantitative Literacy) and the objectives of the MLS program. Several of the standards also match National Accrediting standards. Students are measured for:

1. Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology and other emerging diagnostic venues.

This outcome may be measured by the student's work product in all laboratory classes taught during the program. Professionally, students will be expected to demonstrate competency at the completion of on the job training and annually thereafter. The MLS program gives students knowledge of the subjects required to make clinical decisions, and also the ability to perform the analytical testing as they would in the workplace. Each program **course** contains a demonstration of **competency** through the classroom laboratory exercises. Successful completion of the **externship** is based on a list of **competencies** that must be performed while the student is in the workplace. This programmatic outcome matches NAACLS standard entry level competencies of the Medical Laboratory scientist that state, *"At entry level, the medical laboratory scientist will possess the entry level competencies necessary to perform the full range of clinical laboratory tests in areas such as Clinical Chemistry, Hematology/Hemostasis, Immunology, Immunohematology/Transfusion medicine, Microbiology, Urine and Body Fluid Analysis and Laboratory Operations, and other emerging diagnostics, and will play a role in the development and evaluation of test systems and interpretive algorithms."*

2. Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.

This outcome measures student **data analysis and inquiry** skill as well as their **quantitative literacy** or ability to interact with written results. Professionally students will be expected to read and interpret clinical data from automated instrumentation to determine if those results are accurate or to identify problems with instrumentation or samples. Student abilities are measured by performance on a comprehensive Certification exam, laboratory exercises and tests in course work throughout the program. Every class in the program focuses on data analysis and **troubleshooting** to some extent. This outcome matches NAACLS entry level competencies of the Medical Laboratory scientist that state, *"The medical laboratory scientist will have diverse responsibilities in areas of analysis and clinical decision-making."*

3. Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients.

This outcome measures student **ethical reasoning** with a focus on interprofessional interaction of a team caring for a patient. During participation in OHSU's IPE course, the students in the MLS program are given an opportunity to work with first year medical, RN, PA, dentistry, nutrition, EMS and/or pharmacy students from OHSU as an interprofessional team to work through ethical reasoning scenarios that affect patient care. This project extends the length of the MLS program; the groups meet officially three times on the OHSU campus, then twice on their own time as small groups to complete projects and presentations. Ethical issues are discussed in all courses throughout the program. **Foundations of Medical Laboratory Science I**

at the beginning of the program assigns students a specific **ethics project** that was utilized for measuring 2018 ESLO. Students are also rated by their **externship** site at the end of the program for ethical understanding. Through the many team exercises provided students become aware of the **diverse perspectives** of the care giving team and the patient perspective. This outcome matches NAACLS entry level competencies of the Medical Laboratory scientist that state, *“At entry level, the medical laboratory scientist will have skills in principles and practices of professional conduct...”*

4. Maintaining appropriate composure under stressful conditions.

This new PSLO was introduced by staff during annual Assessment report review at the Department Retreat in 2018. Previously part of PSLO3 and PSLO5, it was decided that a measure of composure under stress should really be its own measurable objective. The program itself is rigorous and stressful; how a student comports themselves in the academic environment may show how they comport themselves in a professionally stressful environment, with heavy workload and emotional demands in the patient care setting. The program strives to measure this objective during the **externship** experience and on professional development evaluations from faculty during the academic year. Specifically, stress may be measured by cortisol levels in **MLS 416 Chemistry II** while the students concentrate on this subject.

5. Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management.

This outcome covers the managerial aspects of coursework. Students who graduate from the MLS program will be qualified to manage the clinical laboratory after two years of professional practice. Students are made aware of continuous improvement activities in their Foundations of Medical Laboratory Science courses and are given several tasks to perform on the subjects while out on externship. In course work, this objective may be measured by the completion of **specific projects** on education, Quality control or finances. This outcome matches NAACLS entry level competencies of the Medical Laboratory scientist that state, *“At entry level, the medical laboratory scientist will have skills in principles and practices of administration and supervision as applied to clinical laboratory science and educational methodologies and terminology sufficient to train/educate users and providers of laboratory services.”*

6. Application of safety and governmental regulations and standards as applied to medical laboratory practice.

Since Medical Laboratory science is a highly regulated profession, students are required to become familiar with safety and best practice standards governing their laboratory actions. Students are required to participate in HIPAA education before working with OHSU patient samples. Students learn and perform Quality Control activities for most tests in the classroom laboratories and the Foundations of Medical Laboratory Science II class has an inspection exercise incorporated into the curriculum. This outcome is measured by student performance in quality control activities in the **laboratory** classroom and in **externship**. This outcome matches NAACLS entry level competencies of the Medical Laboratory scientist that state, *“At entry level, the medical laboratory scientist will have skills in application of safety and governmental regulations and standards as applied to clinical laboratory science.”*

7. Effective communication skills to ensure accurate and appropriate information transfer.

This outcome measures students' ability to **communicate** orally and in the written word. Oral communication is important to **teamwork** and will be necessary when dealing with other health care professionals, during work-load hand offs at shift change and during problem solving. Written communication is measured through the writing of reports and procedures. Students entering the program should already have experience with both types of communication. An **oral presentation** of a comprehensive case study is made during the last term of the didactic portion of the program. Students **work in groups** to organize and present the case study material. Students are also given a variety of reports to write for the various courses simulating those reports written professionally. This outcome matches NAACLS entry level competencies of the Medical Laboratory scientist that state, *“At entry level, the medical laboratory scientist will have skills in communications sufficient to serve the needs of patients, the public and members of the health care team.”*

## NAACLS Requirements

A review of the results of the following outcomes measures from at least the last three active years must be documented, analyzed and used in program assessment and continuous quality improvement of the program to include an annual submission to NAACLS. Minimum standards include: 1) External certification results 2) Graduation rates 3) Placement rates (i.e., employment positions in the field of study or pursuit of further education) 4)Attrition rates

## Essential Studies Learning Outcomes (ESLO)

Oregon Tech has defined Essential Learning Outcomes that support the mission and core themes of the University. Each program chooses one assignment for submission of student data as evidence of student progress on an outcome annually. The outcomes are measured in a three-year cycle where data collection is the first year, analysis of the data and improvement planning occurs in the second year, then implementation of the improvements occurs in the third year. The outcomes that are measured are:

1. Diversity and Global Perspectives
2. Communication, Teamwork and Ethical Reasoning
3. Data Inquiry & Analysis and Quantitative Literacy

Analysis of the student data is shared with faculty for use in program assessment. Not all program data is included in the student data that is analyzed. Medical Laboratory Science program, while continually contributing data, has not had its data analyzed in the past two years of the cycle.

## PSLO Changes

PSLO 4 was introduced during review of the assessment report during the class of 2018-19 review cycle. Class of 2019 exhibited quite a bit of stress reactions during the course of the program such that faculty met with the campus psychologist in order to gain tools for better instructing this class. As a measure of student performance under stress in the clinical setting, faculty approved the removal of PSLO4 from PSLO3 where it had previously been measured every other year. Going forward PSLO4 has been measured as its own outcome.

During the class of 2019 review cycle, University ESLOs were linked to the PSLOs in order to ensure that all essential outcomes were being measured in some way during the course work. It was found that Diversity and Global Perspectives didn't have a good fit anywhere. In order to rectify this, a proposal has been accepted this year to change the wording of PSLO3 to include diversity language. Going forward after this report, PSLO3 will read "Professional and ethical conduct, respecting the **culture and diversity of individual preference** of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with welfare of patients."

## Section 4 & 5 – Curriculum Map & Assessment Cycle

### NAACLS MEASURES

NAACLS Accreditation criteria is assessed annually. Graduation, attrition and placement data is gathered from University graduation records and University **Student Exit Survey reports** that are provided to the assessment coordinator for use in annual assessment reporting. Board Certification Passage is generated in a report from ASCP by the Program Director. Additional placement data is gathered through faculty contact with recent graduates. Data is stored on a shared assessment data file by the assessment coordinator.

OIT/OHSU MLS program has set the following minimum standards for achievement on these data:

	<b>NAACLS Minimum Standards</b>
Certification Passage	75%
Graduation Rate	70%
Placement Rate	70%
Attrition	Must be documented

## PSLO MEASURES

Each year, PSLO assessment is taken from *student exit survey* as an **indirect measure** of student achievement. Minimum standards to be met for this is that 85% of students rate the impact of their education at Oregon Tech on the course outcome as “quite a bit” or “very much”. Specified questions from the *professional development evaluation* (a document filled out about the student from the clinical externship site) has been chosen as a **direct measure** of the PSLO at the **Capstone** level. Minimum standards to be met for this is that 95% of students receive a grade of 2 or greater by the clinical externship site on the specified assessment question.

**Foundational** and **Practice** level achievement on PSLOs are **directly measured** by student performance on individual representative coursework chosen. All faculty were asked to identify in each of their courses a project or exam from the academic year that would measure each of the listed outcomes that their course covers. If measured, these outcomes are listed in course syllabi. All identified exams and projects were necessary components to the courses and were graded by the instructor of the course according to their classroom specific rubric. Some courses did not lend themselves to every outcome. Minimum standards for meeting this outcome are 85% of students achieving a grade of B or greater on the specified assignment.

PSLO Wording	Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology and other emerging diagnostic venues.	Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.	Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients.	Maintaining appropriate composure under stressful conditions.	Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management.	Application of safety and governmental regulations and standards as applied to medical laboratory practice.	Effective communication skills to ensure accurate and appropriate information transfer.
PSLO #	1	2	3	4	5	6	7
PDE Question	10	18	36	8	7	3	50
Direct	Obtains accurate and precise results.	Shows logical thinking and resourcefulness in dealing with problems.	Demonstrates integrity and ethical behavior.	Maintains work Quality and Quantity under stress.	Performs appropriate quality control/ quality assurance procedures.	Follows laboratory institutional safety policies.	Receives/gives information to others effectively & courteously.

Indirect	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	Please rate your proficiency on this outcome?
ESLO	Quantitative Literacy	Inquiry & Analysis	Ethical Reasoning				Teamwork

## CURRICULUM MAP OF PSLO

Courses within the program are identified in the Curriculum Map below with which outcome their coursework best provides data for and their expected level of demonstration for each outcome as either foundational outcome development, practice of foundational outcome, or capstone achievement of the outcome. Questions on the Professional Development Evaluation given every year, that apply to the outcome are specified. The top line refers to the outcomes as numbered in the PSLO list above.

<p><b>MLS Program Learning Objectives Curriculum Map</b></p> <p><b>F – Foundation</b>  <b>P – Practice</b>  <b>C – Capstone</b></p>
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COURSE	PSLO1	PSLO2	PSLO3	PSLO4	PSLO5	PSLO6	PSLO7
<b>Hematology Series</b>							
MLS442 Hem I	F	F		F	P	P	
MLS 452Hem II	P	P		P	P	P	
MLS 449 UA	F	P		P	P	P	
MLS 424 Hemostasis	P	P		P	P	P	C
MLS 471 Externship	C	C	C	C	C	C	C
<b>Chemistry Series</b>							
MLS 415 Chem I	P	F		F	P	P	
MLS 416 Chem II	P	P		F	P	P	
MLS 417 Chem III	P	P			C	P	
MLS 470 Externship	C	C	C	C	C	C	C
<b>Foundations Series</b>							
MLS 432 Found I	F	F	P	F	P	F	P
MLS 462 Found II		P	P	C	P	P	C
MLS 463 Found III		C		C	C	C	C
<b>Microbiology Series</b>							
MLS 474 Parasit	P	F		F	P	P	
MLS 464 Myco/Viro	P	F			P	P	P
MLS 444 Micro I	F	F		F	P	P	
MLS 445 Micro II	P	P		P	P	P	
MLS 472 Externship	C	C	C	C	C	C	C
<b>Blood Bank Series</b>							

MLS 420 Immunology	F	F		F	P	P	
MLS 443 BB I	F	F		F	P	P	
MLS 453 BB II	P	P		C	P	P	
MLS 473 Externship	C	C	C	C	C	C	C
<b>Stand Alone Courses</b>							
MLS 422 Molecular	P	F		P	P	P	C
MLS 457 Research		C	C		C	C	C

Utilizing the best fit course to the outcome, an assessment cycle map was created. As much as possible, two courses are assigned to give data for the outcome each year. As many courses as were best fit for demonstration of the outcome were rotated through the cycle map giving data on the courses from different cohorts. This information should give the program data that can be more directed toward specific coursework as the focus of improvement. ESLO are included in the cycle map as well by the year that data will be collected for that outcome.

	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
PSLO1	MLS 474 Parasitology MLS 416 Chem II Lab Practicum	MLS 420 Immunology MLS 453 Immunohematology II	MLS 449 UA MLS424 Hemostasis	MLS 464 Mycology/virology MLS 445 Micro II	MLS 422 Molecular MLS 452 Heme II
PSLO2	MLS 449 UA MLS 452 Heme II	MLS 474 Parasitology Case Study MLS 417 Chem II	MLS 420 Immunology MLS 453 Immunohematology II	MLS424 Hemostasis MLS 422 Molecular	MLS 464 Mycology/virology MLS 445 Micro II
PSLO3	MLS 432 Foundations I Ethics Project	MLS 432 Foundations I Ethics Project	MLS 432 Foundations I Ethics Project	MLS 462 Foundations II Diversity project	MLS 432 Foundations I Ethics Project
PSLO4	Not Measured	MLS416 Chem II Stress Test	MLS416 Chem II Stress Test	MLS41Chem II Stress Test	MLS 416 Chem II Stress Test
PSLO5	MLS 462 Fiscal Management Quiz	MLS 432 QC/QA test	MLS 462 Education Project	MLS 462 Fiscal Management Project	MLS 432 QC/QA test

PSLO6	MLS 462 CAP Inspection Quiz	MLS 432 Safety Project	MLS 462 CAP Inspection Project	MLS 432 Safety Project	MLS 462 CAP Inspection Project
PSLO7	MLS 417 Method Validation (written) MLS 453 Case Study (oral)	MLS 462 SOP project (written) MLS 422 Teach the class Assignment (oral)	MLS 417 Method Validation (written) MLS 453 & MLS 424 Case Study (oral)	MLS 462 SOP project (written) MLS 422 Teach the class Assignment (oral)	MLS 417 Method Validation (written) MLS 453 & M424 Case Study (oral)
University ESLO	Ethics	Teamwork	Quantitative Literacy*	Ethics/Communication / Teamwork	Diverse and Global Perspectives

\*In 2020 the 6 University ESLO were combined into 3 ESLO for a shorted assessment cycle.

## Section 6 – Assessment Activity

### Professional Development Evaluations

Students are evaluated for achievement on professional objectives in knowledge, skills, habits and attitudes by a Professional Development Evaluation form (PDE). Objectives are listed and the student is rated for each objective by an evaluation scale with a simple score of 1-3 (Not Met, Met, Exceed). Instructions for the rating scale are listed at the top of all evaluations.

PDE are given to students during the didactic 12- month course work by all of their instructors at the end of Summer Term. Some courses do professional development evaluations earlier in the year to measure student progress throughout the program. Students may be asked to rate themselves utilizing the form and then instructors give input to the student after review. If an instructor recognizes an issue with a particular student, a PDE may be filled out before the end of summer term. These evaluations are meant to highlight student strengths and weaknesses in professional conduct and laboratory activities before they are released to externship.

During each externship, an evaluation is filled out for the student per department the student rotates in. The externship site is allowed to have as many people as have worked with the student during their 4 weeks in the department to evaluate the student. All student scores from externship PDE are averaged per subject area (microbiology, chemistry, Hematology and Immunohematology) by the instructors after the PDE documents are returned.

Minimum acceptability standard for this is **95% of all students receiving a grade of 2 or greater on the specified professional criteria**. Artifacts from all students participating in externship and going on to graduate in December were examined. This criteria was set at by faculty when the PDE questions were chosen for this purpose because student achievement at this level is mandatory for graduation. Students receiving less than a 2 require review by the program's progress and promotion committee. This may result in remediation of the student. Scores from externship site evaluations only are utilized as a capstone measure of the specified outcome.

#### Direct Measure of PSLO from External Validation for class of 2019.

PSLO1	PSLO2	PSLO3	PSLO4	PSLO5	PSLO6	PSLO7
Obtains accurate and precise results.	Shows logical thinking and resourcefulness	Demonstrates integrity and ethical behavior.	Maintains work Quality and Quantity under stress.	Performs appropriate quality control/ quality	Follows laboratory institutional safety policies.	Receives/gives information to others

	in dealing with problems.			assurance procedures.		effectively & courteously.
100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.	100% of student reports returned received >2 on PDE.

This direct measure of student performance by external validation on all outcomes has been met for all years it has been measured.

## Student Exit Survey Data

As an indirect measure, student exit survey from the most recent graduating class **graduating in December of 2019** asked each student how they felt the program met the stated PSLO. Student perspective on their own learning is relevant to demonstrated confidence with the material given and general satisfaction with the instruction given. Student exit survey is meant to evaluate student satisfaction at the end of the program. This survey had 32 respondents from the class. Minimum acceptability standard for student exit survey is 85% of students rating themselves as impacted “quite a bit” or “very much” by their time in the program for the stated outcome. This minimum level was evaluated and approved by faculty as a level a little higher than most other program standard levels of 80% due to this program being a professional level program.

### Indirect measure of student performance on outcomes by student perception of learning for class of 2019.

PSLO1	PSLO2	PSLO3	PSLO4	PSLO5	PSLO6	PSLO7
How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	How has the OIT experience contributed to this outcome?	Please rate your proficiency on this outcome?
Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology	Proficiency to <b>problem-solve</b> , troubleshoot, and interpret results, and to use statistical approaches when evaluating data.	Professional and <b>ethical</b> conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients.	Maintaining appropriate composure under <b>stressful</b> conditions.	Administrative skills consistent with philosophies of <b>quality assurance</b> , continuous quality improvement, laboratory education, fiscal resource management.	Application of <b>safety</b> and governmental regulations and standards as applied to medical laboratory practice.	Effective communication skills to ensure accurate and appropriate information transfer.

and other emerging diagnostic venues.						
100% of student responses rated Quite a bit or very much	90% of student responses rated Quite a bit or very much	93% of student responses rated Quite a bit or very much	90% of student responses rated Quite a bit or very much	90% of student responses rated Quite a bit or very much	90% of student responses rated Quite a bit or very much	90% of student responses rated Quite a bit or very much

Additionally, individual courses were evaluated using a question from the **Student exit survey**: “To what extent did each of the courses listed below contribute to your knowledge of the subject and prepare you to enter the medical lab workforce as a competent, knowledgeable, and skilled professional?” Student responses were reviewed by faculty and compared with the responses from the exit survey available from previous year. For the 2019 student exit survey, 32 of 41 students responded. Minimum acceptability standard for this new outcome measure for the individual course is a rating of **<10% responding “very little”**. This cut off was chosen because it matched ranges of acceptability for other standards measured for assessment.

Indirect measure of individual course contribution to professional goals from class of 2019

#	Question	Very much	Quite a bit	Some	Very little	Total
1	MLS 415 Clinical Chemistry I	70% 21	30% 9	0% 0	0.00% 0	32
2	MLS 416 Clinical Chemistry II	71% 22	29% 9	0% 0	0% 0	32
3	MLS 417 Clinical Chemistry III	58% 18	39% 12	3% 1	0% 0	32
4	MLS 420 Clinical Immunology/ Infectious Serology	74% 23	23% 7	3% 1	0% 0	32
5	MLS 457 Advanced Chemistry/Immunology Concepts	61% 19	30% 9	6% 2	3% 1	32
6	MLS 422 Molecular Diagnostic Methods	48% 15	42% 13	10% 3	0% 0	32
7	MLS 424 Hemostasis	77% 24	23% 7	0% 0	0% 0	32
8	MLS 442 Hematology I	84% 26	16% 5	0% 0	0% 0	32
9	MLS 452 Hematology II	84% 26	16% 5	0% 0	0% 0	32
10	MLS 449 Principles of Urinalysis	74% 23	23% 7	3% 1	0% 0	32
11	MLS 443: Immunohematology I	61% 19	31% 10	3% 1	3% 1	32
12	MLS 453 Immunohematology II	58% 18	39% 12	0% 0	3% 1	32
13	MLS 444 Microbiology I	77% 24	23% 7	0% 0	0% 0	32
14	MLS 445 Microbiology II	77% 24	23% 7	0% 0	0% 0	32
15	MLS 464 Mycology / Virology	61% 19	26% 8	13% 4	0% 0	32
16	MLS 474 Parasitology	71% 22	23% 7	6% 2	0% 0	32
17	MLS 432 Foundations of MLS I	61% 19	26% 8	16% 5	0% 0	32
18	MLS 462 Foundations of MLS II	58% 18	31% 10	10% 3	0% 0	32

19	MLS 463 Foundations of MLS III	48%	15	29%	9	23%	7	0%	0	32
20	MLS 470, 471, 472, 473 Externships	74%	23	23%	7	3%	1	0%	0	32

These indirect measures of student performance on all outcomes has been met this year for all outcomes measured.

## Assignments Measuring the Outcomes

All student Artifacts from all designated assignments were graded and entered into the tracking sheet for the PSLO. Minimum standard of achievement on this outcome is that 85% of students receive a grade of B or greater on the designated assignment. Grades were generated by the individual instructors of the course and entered into the tracking system. Courses from two different instructors were utilized in the generation of data for the outcome measurement whenever possible. Assignments are described below for each outcome.

1. Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology and other emerging diagnostic venues.

MLS 474 Parasitology Practical Exam measures competency of students performing microscopic interpretation of unknown parasitology slides.

MLS 416 Chemistry II Final Practical measures competency of students performing serological techniques in the chemistry lab.

*Class of 2020 Preliminary Data was collected from student scores on Blood Bank Practical Exam and Immunology Practical Exam.*

2. Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.

MLS 449 UA Final: Demonstration of problem solving and results interpretation is evaluated by student performance on unknown practical exam. See attached assignment in the Appendix.

MLS 452 Heme II Assignment: Demonstration of problem solving and results interpretation is evaluated by student performance on microscopic hematology differentials. See attached assignment in the Appendix.

*Class of 2020 Preliminary Data was collected from student scores on the case study assignments in Parasitology and Chemistry II.*

3. Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients.

Ethics Project: Students work together in groups to assess the ethical quandaries on the fictional laboratory scenarios. As an added element, students then make up their own scenario that might have some ethical questions involved and submit for instructor review.

4. Maintaining appropriate composure under stressful conditions.

No project data has been directly measured for this PSLO for class of 2018 or 2019. For class of 2020, the assignment measuring this PSLO should have been the stress test from MLS 416. Sadly, due to COVID closures of on campus learning, the stress test was not administered.

5. Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management.  
Laboratory Finances quiz was assigned to students during MLS 462 lecture on Laboratory Quality and Finances. Questions evaluated FTE management, cost benefit analysis for bringing on a new test, and identification of certain budget terms.

*Class of 2020 Preliminary Data was collected from student scores on QC/QA exam from MLS 432.*

6. Application of safety and governmental regulations and standards as applied to medical laboratory practice.

Laboratory History and Inspections Quiz was assigned to students during MLS 462 lecture on Laboratory Compliance History. Questions evaluated student knowledge of governmental regulations having to do with Fraud, HIPAA, and the process of accreditation.

*Class of 2020 Preliminary Data was collected from student scores on Laboratory Safety Exam from MLS 432.*

7. Effective communication skills to ensure accurate and appropriate information transfer.  
Written communication is demonstrated by students from a Method Validation Assignment given to students in MLS 417 Chemistry III.  
Oral communication is demonstrated by student group presentations on case studies combining the subjects of Hemostasis and Immunohematology.

*Class of 2020 Preliminary Data was collected from student scores on Oral Teach the Class Presentation given in MLS 422 Molecular and written SOP assignment for MLS 462.*

**Direct Measure of student performance on outcomes by student performance on designated coursework for class of 2019.**

PSLO1	PSLO2	PSLO3	PSLO4	PSLO5	PSLO6	PSLO7
Parasit Practical  Chem II Practical	UA Final  Heme Project	Ethics Project	None	Laboratory Finances Quiz	History and Inspections Quiz	Method Validation Assignment  Hemostasis & BB Oral Cases
100% scored B or greater on Parasitology. 100% scored B or greater on Chem II.	100% scored B or greater on UA project. 80.4% scored B or greater on Heme project.	Direct: 100% scored B or greater on Ethics project.	Stress Test not given (no measurement)	100% scored B or greater on Finances Quiz	79% received B or greater on Inspection Quiz	100% scored B or greater on Written Validation Project. 100% received B or greater on Oral Case Study

Class of 2019 had two outcomes where direct measurement of coursework performance did not meet expected minimum standards: PSLO2 and PSLO6. The problem solving outcome, PSLO2, demonstrated that one course did meet the outcome but the other course did not. Regarding PSLO6, coursework from only one course was used to measure this outcome and it did not meet. Since utilization of student coursework in measurement of outcomes is a fairly new process, this is the first time coursework from each of these courses was used to measure the outcomes. Investigation of the course performance included comparison of scores from previous years on the project and the most recent cohort class of 2020 to look for patterns of performance within the classes. Additional investigation included course assignment alignment with the outcome. Finally, investigation must also look at the larger picture of outcomes measures from multiple years of cohorts to see if overall the program is meeting these outcomes or if these data are an indicator of a systemic problem that needs improvement. Investigation occurred before action plans were created.

## NAACLS Outcomes

NAACLS reported outcomes for **graduating class of 2019** are listed separately from PSLO outcomes. Minimum NAACLS accreditation standards are included in the table below for each item listed.

Board of Certification scores demonstrate student overall knowledge of the subject of Medical Laboratory Science and student test taking ability at the Capstone level. Students will not be allowed to work as Medical Laboratory Scientists unless they pass a certifying exam. Therefore, the success of the program overall hinges on these scores. Instructors write exams designed to familiarize students with standard board exam questions, and students are required to study using a Board Exam approved study guides during their externship.

Graduation rates are determined as a percentage of students who have begun the final half of the program who go on to successfully graduate from the program. Our program consists of 5 consecutive quarter-terms. Students start in the fall and complete the program at the end of the following fall term. Accordingly, the program determined the final half to be when students begin the spring or third term of the five terms of the program. Attrition is determined as the number of students admitted to the program that do not go on to graduate within in the 15-months.

The employment data has been developed as a combination of Graduate Exit Survey and the MLS program contact with graduates. NAACLS requires MLS programs to report yearly average placement rates of students who found employment in the field/ closely related field or who are continuing their education within one year of graduation. They do not include students for which we do NOT have information on or those that choose to not look for employment in the field.

### Direct measure of accreditation outcomes for class of 2019

	NAACLS Minimum Standards	Class of 2019	National Average for MLS programs reported to NAACLS in 2019
Certification Passage	75%	95.2%	85%
Graduation Rate	70%	100%	95%
Employment Rate	70%	97%	96%
Attrition	Must be documented	2	Not reported

These direct measures of student performance on all outcomes have been met for every year that they have been measured.

## Program Outcomes History

The below table compares the assessment data for PSLOs and NAACLS requirements over the last 5 years. Looking at the current data compared to previous, demonstrates that student perspectives on their own progress within the program of PSLOs and individual courses has improved in all categories since it has been measured. PDE evaluations also demonstrated a steady state of high scores of professionalism across the categories. While graduation rates and Certification scores have held steady over the last several years. Only in the last couple of years has employment begun to dip. The addition of coursework to the measurements more directly illustrates where improvement efforts should be focused.

Outcomes	Class of 2020 (Preliminary)	Class of 2019 *Added PSLO 4	Class of 2018 *Changed direct measure of outcome	Class of 2017 *Changed minimum standard of Indirect measure	Class of 2016
PSLO1	Direct: 100% scored B or greater on BB practical and 92.3% scored B or greater on Immunology practical.	Direct: 100% scored B or greater on Parasitology. 100% scored B or greater on Chem II.  Outside: 100% of student reports returned received >2 on PDE.  Indirect: 100% of student responses rated Quite a bit or very much	Direct: 100% scored B or greater on UA final. 85% scored B or greater on Heme II Assignment.  Outside: 100% >2 on PDE. 78% received highest score possible.  Indirect: 100 % rated "Quite a bit" or "very much"	Direct: BOC 95.7% pass rate  Outside: 100% >2 on PDE. 66% received highest grade possible.  Indirect: 96.5 % rated "Quite a bit" or "very much"	Direct: BOC 97.9% pass rate  Indirect: 94.3% student exit survey rated above "somewhat"
PSLO2	Direct: 94.9% of students scored B or greater on cases in both Parasitology and Chemistry.	Direct: 100% scored B or greater on UA project. 80.4% scored B or greater on Heme project.  Outside: 100% of student reports returned received >2 on PDE.  Indirect: 90% of student responses rated Quite a bit or very much	Direct: 100% scored B or greater on Micro II project. 100% scored B or greater on Mycology project.  Outside: 97.4% >2 on PDE. 77% received highest score possible  Indirect: 93.8 % rated "Quite a bit" or "very much"	Direct: BOC 95.7% pass rate  Outside: 100% >2 on PDE. 67% received highest grade possible.  Indirect: 89.7 % rated "Quite a bit" or "very much"	Direct: BOC 97.9% pass rate  Indirect: 82.9% student exit survey rated above "somewhat"
PSLO3	Direct: 100% scored B or greater on Ethics project.	Direct: 100% scored B or greater on Ethics project.  Outside: 100% of student reports returned received >2 on PDE.  Indirect: 93% of student responses rated Quite a bit or very much	Direct: 100% scored B or greater on Ethics project  Outside: 100% >2 on PDE  Indirect: 84.4% rated "Quite a bit" or "very much"	Direct: BOC 95.7% pass rate  Outside: 98.8% >2 on PDE  Indirect: 82.8% rated "Quite a bit" or "very much"	Direct: BOC 97.9% pass rate  Indirect: 60% student exit survey rated above "somewhat"
PSLO4	Direct: unmeasured due to COVID closures.	Direct: Stress Test not given (no measurement)  Outside: 100% of student reports returned received >2 on PDE.  Indirect: 90% of student responses rated Quite a bit or very much	Outside: 100% >2 on PDE	Not assessed	Not assessed
PSLO5	Direct: 100% scored B or greater on QC/QA exam	Direct: 100% scored B or greater on Finances Quiz  Outside: 100% of student reports returned received >2 on PDE.  Indirect: 90% of student responses rated Quite a bit or very much	Direct: 93.5% scored B or greater on Education Project  Outside: 100% >2 on PDE  Indirect: 84.4 % rated "Quite a bit" or "very much"	Direct: BOC 95.7% pass rate  Outside: 100% >2 on PDE  Indirect: 86.2 % rated "Quite a bit" or "very much"	Direct: BOC 97.9% pass rate  Indirect: 82.8% student exit survey rated above "somewhat"
PSLO6	Direct: 100% scored B or greater on Safety Exam	Direct: 79% received B or greater on Inspection Quiz  Outside: 100% of student reports returned received >2 on PDE.	Direct: 100% received B or greater on Safety project.  Outside: 100% >2 on PDE  Indirect: 96.8 % rated "Quite a bit" or "very much"	Direct: BOC 95.7% pass rate  Outside: 100% >2 on PDE  Indirect: 93.1 % rated "Quite a bit" or "very much"	Direct: BOC 97.9% pass rate  Indirect: 91.2% student exit survey rated above "somewhat"

		Indirect: 90% of student responses rated Quite a bit or very much			
PSLO7	<p>Direct: 83.3% received B or greater on SOP assignment.</p> <p>100% scored B or greater on Molecular teach the class assignment</p>	<p>Direct: 100% received B or greater on Oral Case Study and Written Validation Project.</p> <p>Outside: 100% of student reports returned received &gt;2 on PDE.+</p> <p>Indirect: 90% of student responses rated Quite a bit or very much</p>	<p>Direct: 97.8% received B or greater on SOP Assignment. 97.8% received B or greater on Chem II project.</p> <p>Outside: 100% &gt;2 on PDE. 84% received highest score possible</p> <p>Indirect: 100% rated "Quite a bit" or "very much"</p>	<p>Direct: BOC 95.7% pass rate</p> <p>Outside: 100% &gt;2 on PDE. 79% received highest grade possible.</p> <p>Indirect: 96.5% rated "Quite a bit" or "very much"</p> <p>*Changed Survey Question reviewed</p>	<p>Direct: BOC 97.9% pass rate</p> <p>Indirect: 68.5% student exit survey rated above "somewhat"</p>
Average Certification score	NA	547	529 *New BOC published	592	564
Certification Rate	NA	95.2% total pass rate 90.5% first time pass rate	96.7% total pass rate 91.3% first time pass rate	95.7% total pass rate 89% first time pass rate	97.9% total pass rate 91.5% first time pass rate
Graduation Rate	NA	100%	100%	98%	94%
Employment	NA	97%	96%	100%	100%
Attrition #	1/39; 1 delayed to graduate with class of 2021	2/44; 1 enrolled to graduate with class of 2020	0/44	1/46	0/49; 2 enrolled to graduate with class of 2017

## Student Exit Survey Data by Individual Course

#	Response of "Very Little" regarding classroom preparation for workforce entry	2017	2018	2019
1	MLS 415 Clinical Chemistry I	10.34%	0.00%	0.00%
2	MLS 416 Clinical Chemistry II	10.34%	0.00%	0%
3	MLS 417 Clinical Chemistry III	13.79%	9.38%	0%
4	MLS 420 Clinical Immunology/ Infectious Serology	17.24%	0.00%	0%
5	MLS 457 Advanced Chemistry/Immunology Concepts	17.24%	0.00%	3%
6	MLS 422 Molecular Diagnostic Methods	0.00%	0.00%	0%
7	MLS 424 Hemostasis	0.00%	0.00%	0%

8	MLS 442 Hematology I	0.00%	0.00%	0%
9	MLS 452 Hematology II	0.00%	0.00%	0%
10	MLS 449 Principles of Urinalysis	0.00%	0.00%	0%
11	MLS 443: Immunohematology I	3.45%	0.00%	3%
12	MLS 453 Immunohematology II	0.00%	3.13%	3%
13	MLS 444 Microbiology I	0.00%	0.00%	0%
14	MLS 445 Microbiology II	0.00%	0.00%	0%
15	MLS 464 Mycology / Virology	3.45%	6.25%	0%
16	MLS 474 Parasitology	3.45%	0.00%	0%
17	MLS 432 Foundations of MLS I	3.45%	0.00%	0%
18	MLS 462 Foundations of MLS II	10.34%	12.50%	0%
19	MLS 463 Foundations of MLS III	3.45%	15.63%	0%
20	MLS 470, 471, 472, 473 Externships	0.00%	0.00%	0%

## Faculty Discussion and Interpretation

This data was presented to faculty on September 14<sup>th</sup>, 2020 during an all faculty department meeting. Faculty were encouraged by the external data, Accreditation data, and student exit survey data. Much discussion was had about alignment of course work appropriately to the measurement of outcomes. Significant effort will be taken during the 2020-2021 year to align course syllabi and in particular pinpointing particular assignments to PSLO outcomes. It is felt that all courses adequately present materials that help students progress on the indicated outcomes, but measurement of student progress isn't always easily defined. Despite the effort it will take, faculty feel that the course work performance indicators are the most informative piece of the assessment process other than student BOC passage. Final approval of this report from faculty was given during a meeting on October 5<sup>th</sup>. The October 5<sup>th</sup> meeting covered approval of the updated PSLO3, further discussion of diversity recruiting efforts, and review of faculty responsibilities regarding collection of data for assessment from class of 2020 and 2021. Regarding data from assessment of class of 2019, faculty continue to come up with ways to improve critical thinking activities across course work even through externship including the addition of more open ended questions to the curriculum.

This data will be published with the Office of Academic Excellence and will be presented to the NAACLS accrediting body this year as well as the Advisory Board when the meeting is scheduled.

## Section 7 – Data Driven Action Plans

## Breakdown of PSLO and ESLO data Analysis

PSLO1 - Competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including immunology, hematology, clinical chemistry, immunohematology, microbiology, molecular, hemostasis, urinalysis, body fluids, parasitology, mycology, virology and other emerging diagnostic venues. & ESLO Quantitative Literacy.

Data from class of 2019 indicate that **the program is meeting this outcome**. External measures from student externship experience, internal measure of student work, and student response on exit survey all point to satisfaction of this criteria. Further, if students were not competent in all areas of the laboratory, they could not pass the Board Certifying Exam, as they have in higher percent than national averages. Comparing class of 2019 data with data from previous years, this program has continued to maintain good standing on this particular program outcome. This year the student ability to perform testing accurately in chemistry and microscopy in parasitology directly indicates that the students are competent to perform laboratory testing in multiple areas of the lab. This data plus the data from Hematology and Urinalysis from the previous cohort and immunohematology from the newest cohort support the claim that all of areas of the laboratory are meeting this element.

Regarding **Quantitative Literacy** which the university defines as “the ability to appropriately extract, interpret, evaluate, construct, communicate, and apply quantitative methods to solve problems” the post-analytical interpretation of data gathered during these student laboratory exercises demonstrates student quantitative literacy. Performance on BOC exams also supports the students’ ability to interpret lab produced data as do their scores from externship and student experience from survey.

**No action** is planned for this objective except to continue to monitor student output in all areas. Class of 2020 experienced the simulated laboratory in summer which may have improved their confidence in their achievements on this objective, student exit survey data will show results of that in the 2021 report.

*Data will be collected for measurement of this outcome for University Essential Student Learning Outcomes on class of 2021 from Chemistry II final practical.*

PSLO2 - Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data & ESLO Inquiry and Analysis

Data from class of 2019 indicate that **the program needs to expend some work on this outcome** in certain areas. External measures from student externship experience and student response on exit survey point to satisfaction of this criteria. Further, student exit survey data appears that the program is producing cohorts that are feeling more comfortable with their abilities regarding this objective over time. Class of 2019 was evaluated on performance of problem-solving unknowns in Urinalysis and Hematology. While they met the minimum goal for performance in urinalysis, **they fell short of meeting in Hematology**.

In both assignments, students were required to synthesize the information they were given on a particular patient to choose and perform tests to gather more data all to arrive at a single answer to the patient case. Where the hematology students fell short specifically was identifying alternative diagnoses and determining subsequent lab assays to confirm or rule out other possible diagnoses. Faculty discussion during the September 14<sup>th</sup> Assessment meeting indicated that faculty felt, based on their interactions with students in the 2019 cohort and 2020 cohort, that student ability to use information from the lectures to make decisions should be of improvement focus.

Since 2019 was the first-year assignments in hematology and urinalysis were used to evaluate this particular PSLO, this data served as baseline for improvement measurement over time in those subjects. **Class of 2020** grades on the hematology assignment demonstrated that 82% achieved a score of B or better on the hematology assignment, **still not meeting the criteria**. The assessment process has keyed this instructor into comparing student data on these important assignments over multiple years as a way to judge efficacy of the assignment. **Action plan for this course** is to 1) evaluate the assignment and grading criteria to make sure the assignment reflects problem solving ability, and 2) Give students more case studies to work through during hematology instruction.

Regarding **Inquiry and Analysis** which the university defines as “posing meaningful questions about situations and systems, gathering and evaluating relevant evidence and articulating how that evidence justifies decisions” the students’ ability to problem solve, choose and perform tests to gather data and make a decision regarding diagnosis exemplifies the objective posed by the university.

The ability to problem-solve has come up as a request on student exit surveys, alumni surveys and employer surveys. **Action plan for the program** was implemented summer of 2020 via the introduction of a simulated laboratory experience. The program will

continue to utilize unknown samples to encourage independent thought in focused laboratory areas in addition to the capstone simulated laboratory experience. The four-week intense simulated experience this summer allowed students to work in all areas of the laboratory in a team to problem solve complex patient scenarios. This experience will remain a core part of the curriculum to aid in student problem-solving and trouble-shooting ability. Assessment of this experience will come from multiple instructors via the development and utilization of a critical thinking rubric. Data will be presented with next years' assessment report.

PSLO3 - Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients & ESLO Ethical Reasoning

Data from class of 2019 indicate that **the program is meeting this objective** both in external evaluations of student ethical behavior and in student academic work. Student exit survey results that for class of 2019 after years of improvements this objective is met in all areas.

Regarding **Ethical reasoning** which the university defines as "the process of recognizing which decisions require ethical judgements, determining potential reasonable courses of action and finding support for potential courses of action" the program submitted artifacts of the Ethics Exam from MLS 432 Foundations I for group grading from class of 2018, none of which were chosen for group grading by the university developed rubric. The ethics exam assignment typically gave a scenario to students and students were required to determine which part of the scenario required ethical decision making, then used the code of ethics and their own personal code of ethics to determine a best course of action. Since the instructor of MLS 432 and the assessment coordinator participated in artifact grading for the university, these two instructors became familiar with the university Ethical Reasoning rubric. Based on this experience, the assignment was changed for class of 2019 to include a student developed situation where a person might choose a separate course of action and to list the ethics behind that decision. This change encouraged students to think beyond their own biases. **Student performance on the new assignment in 2019 met the standards for the outcome.** The program feels like the assignment with the additional changes is an adequate measure of student progress on this outcome.

Much of our program focuses on maintaining patient confidentiality as a key component in a patient's right to medical privacy and the potential legal ramifications that a workplace might face. The code of ethics portion of this objective is touched upon in the above-mentioned assignment and then again when the students are working in their interprofessional groups at OHSU (IPE) comparing different codes of ethics for the different health care professions. Sadly, with the removal of class of 2021 from participation in IPE, student progress on this PSLO may suffer. **No action** is planned for this objective except to monitor closely student performance after IPE is discontinued.

PSLO4 - Maintaining appropriate composure under stressful conditions

Data from **indirect** measures of class of 2019 suggest **that the program is meeting this fairly new objective.** At this point students appear to be able to maintain composure in the work environment regardless of stress levels. More direct data on this is desired by faculty.

An assignment measuring stress reaction in MLS 416 Chemistry II was identified for direct measurement of the objective. However, students from class of 2019 refused to participate in the assignment due to anxiety levels felt by the cohort at the time of assignment preparation. It could be concluded from this lack of participation that **class of 2019 did not meet the direct measure for this objective.** The cancelled assignment spurred the faculty to measure this as a part of assessment annually. Healthcare is a stressful environment, part of which is made worse by interactions between people from different perspectives. If a student can adequately maintain composure regardless of internal or external stressors and still maintain quality of work, they are doing their best for the patient.

**Action plan** for class of 2020 was to be that students were not prepared ahead of time for the stress exercise, in order to prevent an anxiety reaction to the assignment. Sadly, an outside stressor derailed the intended data collection from class of 2020. Pandemic forced all courses for the term Chemistry II was taught in to move to an online platform. The stress test could not be conducted unless it was in person. Further action to understand and mitigate stress reactions felt by students was taken by faculty even without a direct measure of assessment available. Faculty met in 2019 with the campus counselor to gain training on stressful student interactions. Faculty also attended continuing education trainings on stress management in the healthcare setting. Additional focus on stress management has been added to the orientation materials and several courses in the program including MLS 462 Foundations II and the Simulated laboratory debrief discussions. Faculty look forward to reviewing data from class of 2021.

PSLO5 - Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management.

Data from class of 2019 indicate that **the program is meeting this objective** both in external evaluations of student quality control performance and in the student performance on related coursework. Student exit survey results are variable in regards to meeting this objective at the minimum standard of 85% contribution from their OIT experience.

This objective does encompass quite a bit of material. A student must understand quality assurance and quality control which is asked about on their PDE and is demonstrated in their daily laboratory activities. A student must also show abilities in fiscal management which they aren't expected to do in practice until they are in management positions. Then, proficiency in laboratory education which they might do more than a year after graduation and after their own training is complete. The rotation of assignments to demonstrate these different aspects of the single objective revealed that though students were lacking confidence in their abilities to perform these tasks, their work performance proves that they are competent. Class of 2018 was assessed on educational methods, class of 2019 was assessed on fiscal management, and class of 2020 was assessed on QC/QA. All cohorts met the criteria set by the program.

**No action** is needed on this objective at this time. Instructors have been tasked with improving rubrics related to the assignments used to measure this objective to ensure that the assignments selected accurately reflect student outcomes. In future multiple instructors may be included in the grading of these assignments to provide a less biased reflection of student performance.

PSLO6 - Application of safety and governmental regulations and standards as applied to medical laboratory practice.

Data from class of 2019 indicate that by external measures from student externship experience and student response on exit survey that the program is meeting this objective, however, direct measures indicate that **class of 2019 did not meet the government regulations** portion of this objective with 79% receiving a B or greater on the assignment. Since 2019 was the first year the assignment had been used for assessment, the assignment served as a baseline for improvement activities. Class of 2020 was evaluated on the same assignment after receiving instruction in the online platform. 100% of students scored a B or above. **Action plan for this course** is improvement of the assignment itself. Previously the assignment was based on an open book quiz, the instructor would like it to be more rubric based on specific student critical thinking input. The instructor of the course recently enrolled in a compliance continuing education course and has gained ideas from this experience to improve the instruction and evaluation of this piece of the course.

In alternate years, students are measured for their understanding of **Safety standards** as applied to laboratory practices. Class of 2020 data for assessment included student performance on a safety exam. Students have continued to meet the minimum performance criteria on this portion of the objective. Additionally, student performance on this outcome is reflected from the number of **student safety events** that occurred in student lab and/or on externship. Class of 2018 had **2 adverse events** related to eye contamination. Class of 2019 was required to wear protective eye wear during all laboratory activities in student labs, and no further incidents occurred in student lab. On externship, **one exposure** to an infectious agent occurred for class of 2019 unrelated to eye exposure. For class of 2020 extra precautions in infection prevention have been instituted to student labs and at hospital sites that will be carried forward for class of 2021. Students are required to wear cloth masks covering noses and mouths, protective eye wear, gloves and lab coats at all times both in student lab and on externship. Additional signage has been posted in student lab as well as a safety video. Class of **2020 has had no exposures**, and thus far no COVID cases have been attributed to student laboratory exposure in any class participated in by the now three cohorts that have been on campus. This situation will be continuously monitored through 2021.

PSLO7 - Effective communication skills to ensure accurate and appropriate information transfer & ESLOs Teamwork and Communication

Data from class of 2019 indicate that **the program is meeting this outcome**. External measures from student externship experience, internal measure of student work, and student response on exit survey all point to satisfaction. Student communication is evaluated annually both by performance on a **written** assignment and an **oral** assignment. Oral assignments are presented in groups. **Oral assignment grades are dependent on how well the team works together** to produce the final product. **Communication** amongst team members being a valuable life skill for working within the laboratory and within interdisciplinary health care teams. **No action** is planned for this objective except to continue to monitor student output in both written and oral communication.

The 2019 and 2020 curriculum has spent much time emphasizing the team aspect of laboratory medicine in Orientation, Coursework and IPE participation. Through participation in interdisciplinary teams at OHSU's IPE, students were made aware of their contribution to the health care team. This absence will be felt by class of 2021. Group exercises continue to be especially important when working within the academic cohort. As the academic year progresses, curriculum emphasizes group work to a greater degree culminating in an onslaught of group projects assigned in the summer term. The university defines **teamwork** as "the ability to accomplish group tasks and resolve conflict within groups". Measurement of teamwork as a component of the oral presentation will continue to play a major role in assessment at the program level. Class of 2020 were surveyed by the University in order to gather data for the University on the Teamwork ESLO. Students participating in the Group Case Study assignment in Blood Bank and Hemostasis classes were asked about this group experience, however analysis of the Teamwork surveys by University faculty were only performed on surveys returned for coursework covered in fall, winter, or spring terms, so data from the MLS department was again not included. Measurement and reflection on the University summarized data indicates some startling takeaways. 1) There is a disconnect between an instructor perspective on team functionality demonstrated by the different positives and negatives assessed by these different perspectives. 2) The teamwork items rated most low commonly by instructors and students alike had to do with items that are societal challenges as well. Teams tended to be more polarized and unable to have constructive disagreements. For the MLS program, the societal trend of not listening actively in order to have constructive disagreements been noted by faculty for awhile. Especially important to the program and the profession is the ability of individuals from different factions (nursing vs laboratory) to be able to listen to each other courteously and learn from each other. The MLS program introduced curriculum around active listening to the Orientation in 2017. For Orientation of class of 2021, MLS faculty reinforced teambuilding concepts, based on recommendations from class of 2020, by assigning groups for the first group assignment for fall coursework and assigning the practice of group dynamics. Other efforts made regarding teamwork have included the involvement of student in Interprofessionalism workshops.

## ESLO – Diverse Perspectives

Given the current culture in the United States, a focus on **recruiting** and graduating a diverse group of students from the program and on **instruction** meant to enhance student understanding of diverse and global perspectives has become necessary to all programs performing in higher education.

Regarding recruitment efforts, dashboards have been created by the University for programs to monitor the diversity of their cohorts. This data was utilized for the first time by the MLS program in this report. Cohort diversity data from the past 5 years was compared against state Census bureau data. It was found that cohorts graduated from the MLS program over the past 5 years have been classified as predominantly white and female. Deep dive into the breakdown of students of color that graduated from the program in the past 5 years, revealed that cohorts do not match the population of Oregon. Though the highest population percentage of people of color in Oregon are classified as Latinx, graduates from the program reported themselves as Asian in highest percent. **Action plan** on this is to concentrate recruitment efforts for people of color in both the Latinx communities and black communities in Oregon which are underrepresented in the cohorts. Class of 2020 cohort appears to have been more representative of Oregon population demographics than any yet. Efforts are being made to investigate ways to advertise the program as welcoming of diversity. Efforts are also underway to contact high school teachers in specific districts to arrange for faculty recruitment visits. Potentially detrimental to diversity efforts for recruiting to this program, is the requirement of fluency in the English language. To practice professionally in the United States and to ensure patient safety by facilitating appropriate communication in a predominately English speaking workplace, graduates must sit for the Board of Certification Examination that is only given in English.

At the instruction level, it was observed on the previous assessment report, that the program had not identified a way of assessing student progress on understanding of diversity and global perspectives. This has been a University level ESLO since 2013 but no data has been collected from the MLS program. Further, there is not a program specific outcome that is in alignment with this University outcome. The university defines diverse perspectives as "requiring self-awareness, intellectual flexibility, and broad knowledge that enables perception of the world through the eyes of others". **Action plan** on this at the programmatic level is to amend one of the PSLOs to include Diversity wording. PSLO3 which reads, "Professional and ethical conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients."

Has been amended to say, "Professional and ethical conduct, respecting the culture and diversity of individual preference of others, protecting the confidence of patient information, and never allowing personal concerns and biases to interfere with the welfare of patients." Faculty approved this PSLO amendment at the October 5<sup>th</sup> meeting.

Measurement of this outcome will alternate between data gathered from the ethics exam and data gathered from the new course assignment added to Foundations of Laboratory Science II. **Action plan** on this outcome at the course work level was that for class of 2020 a lecture and laboratory assignment was dedicated to diversity in the workplace and understanding different perspectives. The

assignment related different perspectives on workplace conflicts and was graded as pass/fail. For class of 2021, the work product produced by students will be graded based on a diverse perspectives rubric and included in assessment of class of 2021.

## Student Exit Survey Results Analysis

Class of 2019 rated their experience in the program as impactful and meaningful to their career in all areas. They had many concrete suggestions for improvements that could be made to make the program a better experience for other students that came after them. Those suggestions have already been put into place in some cases due to the sudden closure in spring of 2020. Students overall felt that their time in the program was well spent.

## Assessment Budget Alignment

Action plans were developed for PSLOs 2, 4 and 6. Problem solving, stress management and Safety and Government Regulations. The 2019 MLS department budget included faculty continued education. The specific conferences attended by faculty covered the subjects of stress management and simulated laboratory development. Simulated laboratory development is a significant effort toward improving student problem solving ability and to some extent stress management.

The program also expended some money on the purchase of PPE for students such that all students would have their own pair of safety glasses and masks. In the community, the program donated spare PPE to local hospitals that were in need of safety equipment demonstrating a commitment not only to safety of the students but safety of the community.

The biggest expense this year was the implementation of the simulated laboratory experience which required the purchase of additional laboratory and reagents materials and reorganization of laboratory space. It was felt that the expense and eventual improvements in problem solving would be well worthwhile.

Though no action plans were necessary for the other PSLOs except monitoring, the program maintains an annual subscription to Media Lab, an online test bank database meant to mimic certifying exam environment. Students utilize media lab content to supplement coursework throughout the academic year which culminates in access to the test bank during externship when students are expected to independently study for their certifying exam. Certifying exam performance is a major indicator to program accrediting bodies of program assessment and will be continued to be supported through the MLS budget.

## Section 8 – Closing the Loop: Evidence of Improvement in Student Learning

### Look Back at Past Action Plans

Action plans from 2017 cohort data focused on improving student confidence in their education both in ethics and problem solving by the addition of case studies to multiple courses within the program and including students in interprofessionalism course work. Action plans from 2018 cohort data included the introduction of the simulated laboratory experience to increase student confidence in their competency and problem solving ability, adding procedures to the laboratory tablets to aid in student troubleshooting in real time and familiarity with laboratory equipment, participation in IPE in order to increase familiarity with professional codes of conduct from health disciplines and how to effectively participate as a member of an interdisciplinary team, include stress management in multiple courses within the program, assignment rubric improvement for fiscal management and education projects, tracking laboratory safety incidences, and locating within the curriculum where diverse perspectives might be included.

Looking at the data since 2017, the additions to the coursework and focuses seem to have increased student confidence in their education and abilities. Student exit survey responses increased from below the 85% threshold to clearly in range at 90-100% of the 2019 cohort feeling like their course work increased their abilities in all areas measured. Two cohorts of students have participated in interprofessionalism coursework, safety incidences have been documented and demonstrated a decrease, diverse perspectives

curriculum was designed and implemented, and all courses have procedures on the laboratory tablets. The simulated laboratory piloted with the class of 2020 as well which included debriefs that discussed and prepared students for management of stress in the workplace. Overall, it seems that faculty achieved course improvement goals and students achieved confidence goals set forth by previous action plans.

The current data demonstrates a continued need to focus on problem solving in the curriculum and diversity recruitment. Problem solving ability being a difficult subject overall to teach, will probably always be a focus of improvement for this program. Faculty do feel like the addition of the simulated laboratory experience for students will make the biggest improvement in this area. Though interprofessionalism coursework has demonstrated positive student performance, students in class of 2021 will not participate in the OHSU provided workshop. Faculty will need to continue to find ways in which to supplement this necessary experience, until participation can be reestablished after quarantine.

Assessment process changes have been evaluated over the years as well. Looking at the data from this year, if the assessment process used to evaluate cohort of 2016 had been used for cohort 2019 (that of evaluating Accreditation data and Student Exit Survey data only) no focused improvement plans would be readily apparent from the data. The addition of coursework to assessment processes has really brought forth focused coursework change. The addition of looking at ESLO data in conjunction with PSLO data has allowed the program to stay in alignment with University Standards as they have been developed. Because of this alignment, going forward, choosing which data to contribute to University level assessment will be less burdensome on faculty in this department and the department overall has been more adaptable to changes to University assessment processes.

## Summary Statement

The Medical Laboratory Science Department continues to review the process of assessment and make reasonable changes in order to mine the data that will give useful information regarding student performance. Faculty are actively involved in the process and are committed to maintaining high standards of performance for their students. Student performance in the program has been stable for many years despite faculty and location changes. Faculty are also committed to making improvements in their own knowledge of laboratory science, teaching processes and presentation of curriculum to keep current and to allow their students to perform to the highest standards. The budget has allowed this commitment to see fruition through support of faculty travel and the purchase of vital program equipment that modernizes student learning. The student experience of the program is a respected element of the performance of the program and will continue to be reviewed in order to provide an excellent source for improvement ideas to individual courses. Student work in individual courses that represent program outcomes has been the most informative change to program assessment and continues to express student achievement across the courses that is reinforced by student performance on outside measures of student competence in externship and on certifying exams.

## APPENDIX

1. BOC results Class of 2019
2. Student Exit Survey 2019
3. PDE spreadsheet 2018-2019
4. Program Assessment Feedback 2018
5. Meeting Minutes from Faculty Assessment meetings

**Board of Certification Program Performance Report**

School Code: 036006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)

Date Type: EXAM Start Date: 12/13/2019 End Date: 6/23/2020

Medical Laboratory Scientist  
Oregon Institute of Technology / Oregon Health and Science University  
PO Box 872  
Portland, OR 97207-0572  
USA

**This Program Performance Includes the following parts:**

- First time individual student scaled scores
- Program and National scaled score comparisons
- Repeaters individual student scaled scores
- Distribution of examinee scaled scores

We wish to express our appreciation for your cooperation in keeping individual records confidential and in working with the Board of Certification to maintain our standard of excellence.

**IMPORTANT**

Program Performance Report (PPR) data is NOT to be shared with the public. The Program Performance Report is a paid subscription service meant for Program Directors and Program Administrators ONLY. The PPR (including the histograms, individual student data and subtest means) is not public information, and it is inappropriate to publicize this data in recruitment efforts. However, Program Directors can provide the scaled score comparisons for "First Time Examinees from the Total Population" (located within the "Program and National Scaled Score Comparisons" section) as an outcomes measure for accreditation purposes.

The information contained in Program Performance Reports should be handled in a confidential manner which respects the rights of the individual whose scores are reported.

All examination scores are reported in scaled score. A scaled score is mathematically derived (in part) from the raw score (number of correctly answered questions) and the difficulty level of the questions. Because each examinee has taken a different form of the examination, scaled scores are used so that tests may be compared on the same scale.

The minimum passing score is 400. The highest attainable score is 999.

For Subtest Information: [Please refer to the Examination Content Specification](#)

**Board of Certification Program Performance Report**

School Code: 036006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)

Date Type: EXAM Start Date: 12/13/2019 End Date: 6/23/2020

**First Time Individual Student Scaled Scores**

First Time Individual Student Scaled Scores: Minimum Passing Score MPS=400

Student	Examinee Name	Exam Date	BIOL	UA	CHEM	HEVA	IMM2	MICR	LO	Total	Status
1	[REDACTED]	Mar 10 2020	450	450	558	240	198	309	223	2031	FAIL
1	[REDACTED]	Dec 23 2019	534	483	441	521	574	578	541	3600	PASS
1	[REDACTED]	Jan 23 2020	627	293	718	983	907	723	877	4038	PASS
1	[REDACTED]	Jan 8 2020	500	555	506	835	518	481	582	3567	PASS
1	[REDACTED]	Jan 8 2020	771	633	614	706	677	884	819	5092	PASS
1	[REDACTED]	Jan 18 2020	540	289	558	693	512	588	899	3979	PASS
1	[REDACTED]	Jan 8 2020	311	454	462	524	442	422	373	2624	PASS
1	[REDACTED]	Jan 31 2020	533	536	508	630	649	472	637	3665	PASS
1	[REDACTED]	Dec 23 2019	520	563	554	440	404	354	632	3467	PASS
1	[REDACTED]	Jan 8 2020	311	342	557	625	619	368	840	3452	PASS
1	[REDACTED]	Dec 19 2019	604	487	690	632	538	911	583	4536	PASS
1	[REDACTED]	Dec 23 2019	482	594	544	485	274	602	547	3435	PASS
1	[REDACTED]	Jan 8 2020	527	429	338	373	311	440	439	2457	PASS
1	[REDACTED]	Dec 23 2019	505	469	548	397	568	561	585	3533	PASS
1	[REDACTED]	Dec 23 2019	605	605	732	730	657	746	909	4987	PASS
1	[REDACTED]	Dec 19 2019	733	844	852	582	558	561	787	5663	PASS
1	[REDACTED]	Jan 14 2020	527	608	612	537	630	737	523	3634	PASS
1	[REDACTED]	Dec 30 2019	601	609	602	683	638	666	743	4243	PASS
1	[REDACTED]	Jan 3 2020	332	613	498	665	638	705	743	3734	PASS
1	[REDACTED]	Dec 23 2019	467	309	232	482	489	208	255	1943	FAIL
1	[REDACTED]	Dec 19 2019	679	646	657	638	654	813	737	4732	PASS
1	[REDACTED]	Feb 1 2020	305	572	385	240	224	412	518	2354	FAIL

**Board of Certification Program Performance Report**

School Code: 036006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)

Date Type: EXAM Start Date: 12/13/2019 End Date: 6/23/2020

Student	Exam Date	BIOL	UA	CHEM	HEVA	IMM2	MICR	LO	Total	Status	
1	Feb 13 2020	465	331	411	710	412	439	475	439	3491	PASS
1	Dec 23 2019	596	507	412	616	556	528	716	531	4050	PASS
1	Jan 8 2020	489	343	341	576	637	493	458	509	3415	PASS
1	Jan 7 2020	537	330	625	519	554	583	547	532	3635	PASS
1	Jan 3 2020	364	323	549	648	638	612	476	484	3654	PASS
1	Dec 23 2019	337	380	497	311	385	237	586	384	2728	FAIL
1	Dec 16 2019	606	580	755	786	482	534	302	622	4267	PASS
1	Dec 30 2019	601	540	660	674	669	705	628	661	4238	PASS
1	Dec 23 2019	527	580	675	732	782	673	600	623	3860	PASS
1	Dec 23 2019	506	588	518	706	633	666	626	621	3680	PASS
1	Dec 23 2019	432	713	483	587	639	637	598	544	3483	PASS
1	Dec 23 2019	571	633	644	686	635	615	670	642	3853	PASS
1	Jan 3 2020	478	541	583	661	678	679	420	524	3453	PASS
1	Dec 23 2019	484	434	447	478	489	477	421	484	2804	PASS
1	Dec 23 2019	555	710	664	702	619	669	627	621	4263	PASS
1	Jan 9 2020	488	568	487	548	448	542	260	488	2941	PASS
1	Dec 30 2019	501	417	562	646	533	522	395	511	3085	PASS
1	Jan 3 2020	732	663	633	610	520	654	607	688	4204	PASS
1	Dec 18 2019	496	724	614	626	644	606	481	669	4015	PASS
1	Jan 22 2020	440	185	436	404	559	487	637	482	2633	PASS

**Board of Certification Program Performance Report**

School Code: 036006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)

Date Type: EXAM Start Date: 12/13/2019 End Date: 6/23/2020

**Program and National Scaled Score Comparisons**

First Time Examinees From Your Program:

	BIOL	UA	CHEM	HEVA	IMM2	MICR	LO
Program Mean Scaled Score:	520	520	537	575	526	547	553
University Based Program Mean Scaled Score:	612	601	638	618	662	646	616
This Cycle Mean Scaled Score:	510	604	509	517	494	587	511

**First Time Examinees From The Total Population This Cycle**

Type/Score	Program	University	National
Number of Examinees	42	1248	1729
Number Passing (Percent)	38 (90.48%)	1142 (91%)	1493 (86.34%)
Number Failing (Percent)	4 (9.52%)	106 (8.5%)	236 (13.66%)
Mean Scaled Score	547	607	501
Standard Deviation	86	108	109
Minimum Scaled Score Achieved	251	160	186
Maximum Scaled Score Achieved	728	907	907

**All Examinees this cycle:**

Cycle from	University	National
Number of Examinees	1020	2021
Number Passing (Percent)	1247 (82%)	1624 (80%)
Number Failing (Percent)	213 (20%)	437 (21.5%)
Mean Scaled Score	492	490
Standard Deviation	111	114
Minimum Scaled Score Achieved	100	100
Maximum Scaled Score Achieved	907	907

**Board of Certification Program Performance Report**

School Code: 000006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)  
 Date Type: EXAM Start Date: 12/13/2019 End Date: 6/23/2020

**Repeat Individual Student Scaled Scores**

Performance of Repeat Examinees - Minimum Passing Score MPS=400

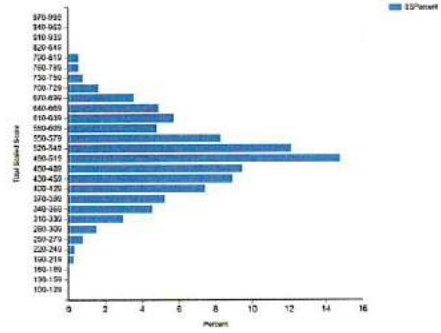
Attempt	Examinee Name	Exam Date	BOOK	SA	CIEM	HTDA	IMJU	MCI	LO	Total	Status
1	[REDACTED]	May 23 2020	463	320	512	421	198	483	548	518	PASS
2	[REDACTED]	Mar 19 2020	408	350	477	425	351	351	353	418	FAIL

**Board of Certification Program Performance Report**

School Code: 036006 Exam Code: MLS [Go To Program Performance Report \(PPR\)](#)  
 Date Type: EXAM Start Date: 12/13/2019 End Date: 02/20/2020

Examinees Repeating The Examination Are Not In Summary Statistics. The Following Histogram Provides A Picture Of The Distribution Of Individual Examinee Total Scaled Scores By Percent.  
 N = 1729

**Distribution Of Examinee Total Scaled Scores - First Timers Only**









PSLO4

%Stress Test	Hematology	Chemistry	Microbiology	Immunohematology	#3	#2	#1	#NA
3	2	2	2	2	1	3	0	0
2	3	2	2	2	1	3	0	0
3	2	3	2	2	2	2	0	0
3	2	3	3	3	3	1	0	0
2	2	2	2	2	0	4	0	0
3	2	3	3	3	3	1	0	0
3	2	2	2	2	1	3	0	0
3	2	2	2	2	1	3	0	0
3	2	3	3	3	3	1	0	0
3	3	3	3	3	2	0	0	0
3	2	3	2	2	2	2	0	0
3	2	3	3	3	3	1	0	0
3	2	3	3	3	3	1	0	0
2	2	2	2	2	1	3	0	0
3	2	3	3	3	3	1	0	0
3	3	3	3	3	4	0	0	0
3	2	2	2	2	2	2	0	0
2	3	3	2	2	2	2	0	0
3	2	3	2	2	2	2	0	0
2	3	2	2	2	1	3	0	0
2	2	2	2	3	1	3	0	0
3	2	2	2	na	1	2	0	1
3	2	3	3	3	3	1	0	0
3	3	2	2	2	2	2	0	0
3	2	2	2	2	1	3	0	0
3	2	2	2	2	1	3	0	0
3	2	3	3	3	3	1	0	0
3	3	2	3	3	3	1	0	0
2	2	3	3	3	2	2	0	0
3	3	3	3	na	3	0	0	1
3	2	3	2	2	2	2	0	0
3	3	3	3	3	4	0	0	0
2	2	3	3	3	2	2	0	0
3	2	3	3	3	3	1	0	0
3	2	2	3	3	2	2	0	0
3	2	3	3	3	3	1	0	0
3	2	3	3	3	3	1	0	0
3	2	3	2	2	2	2	0	0
2	3	2	3	3	2	2	0	0
3	3	3	2	2	3	1	0	0
					0	0	0	0
					0	0	0	0
					0	0	0	0
					0	0	0	0
0					91	73	0	2

Maintaining composure under stressful conditions is Measured by scores of Externship PDE performance on action **item #8** "Maintains work quality and Quantity under stress" & grade on Stress test assignment from Chemistry II.

Criterion: 95% receive a score of 2.  
 Criterion: 85% receive a grade of B or greater.

0.00%







# Student Exit survey Class of 2019

Q ESLO 1 7	Q ESLO 2 1	Q ESLO 2 2	Q ESLO 2 3	Q ESLO 2 4	Q ESLO 2 5	Q ESLO 2 6	Q ESLO 2 7
High proficiency	Some	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Some	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Some	Some	Quite a bit	Some	Quite a bit	Quite a bit	Some
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Very much	Quite a bit	Very much	Very much	Very much	Very much	Very much
High proficiency	Quite a bit	Quite a bit	Very much	Quite a bit	Very much	Very much	Very much
High proficiency	Some	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Very much
Proficiency	Quite a bit	Very much	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Very much
Proficiency	Very little	Very little	Some	Very little	Some	Some	Very little
Proficiency	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Some	Some	Very much	Very much	Very much	Very much	Some
Proficiency	Quite a bit	Some	Very much	Quite a bit	Some	Quite a bit	Some
High proficiency	Some	Some	Some	Some	Some	Some	Some
High proficiency	Very little	Some	Some	Very little	Some	Quite a bit	Some
Proficiency	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit
Proficiency	Some	Some	Very much	Quite a bit	Quite a bit	Quite a bit	Quite a bit
High proficiency	Some	Some	Some	Some	Some	Some	Some
Proficiency	Quite a bit	Quite a bit	Very much	Very much	Very much	Very much	Quite a bit
High proficiency	Very little	Very little	Quite a bit	Some	Some	Quite a bit	Very little
Proficiency	Some	Some	Very much	Quite a bit	Quite a bit	Very much	Quite a bit
Some proficiency	Some	Some	Quite a bit	Quite a bit	Very much	Quite a bit	Some
Proficiency	Quite a bit	Quite a bit	Very much	Very much	Very much	Very much	Quite a bit
Proficiency	Very little	Some	Some	Quite a bit	Very much	Quite a bit	Some
Proficiency	Some	Some	Very much	Quite a bit	Very much	Very much	Some
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
High proficiency	Very much	Very much	Very much	Very much	Very much	Very much	Very much
Proficiency	Some	Quite a bit	Very much	Very much	Very much	Very much	Very much
High proficiency	Very much	Quite a bit	Very much	Very much	Quite a bit	Very much	Quite a bit
High proficiency	Some	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit	Quite a bit

PSLO7

20

12

	PSLO1	PSLO2	PSLO3	PSLO4	PSLO5	PSLO6	PSLO7
very little	4	2	0	2	0	0	2
some	13	11	5	4	6	3	9
quite a bit	7	11	9	13	10	13	9
very much	9	9	19	14	17	17	13



Program Assessment Report Feedback

2018-19 Assessment Report

Program: B.S. Medical Laboratory Science B\_S\_ Assessment Report  
 Assessment Coordinator: Rachelle Barrett

Rubric Measure	Score (Out of 4)
Program mission and educational objectives	4
Outcomes: Clarity	4
Outcomes: Student-centered orientation	4
Outcomes aligned with mission/industry/student success	4
Outcomes mapped to course/learning experiences	3
Current year's plan	4
Multi-year cycle plan	4
Valid relationship between outcomes and assignments	4
Valid relationship between outcomes and rubric	4
Types of measures: 2 direct, 1 indirect	4
Alignment of assessment across sites/modes	4
Specification of desired results for objectives	3
Data collection and research design	3
Reliability evidence	2
Presentation of results	3
History of results	4
Document how results are shared with faculty/stakeholders	3
Interpretation of results	3
Closing the loop	2
Weaknesses result in action plans	2
Action plans are linked to assessment findings	2
Plans for improvement of assessment	2
Accountability on improvement	2
Planning/budgeting alignment	2

Please look at your scores and review the 2018-2019 [Assessment Guide](#) with rubric suggestions.

Here is where we scored with the assessment reports combined in each category, the lower scores are where we need improvement the most.

Section 1: Program Mission/Mission Alignment	Total 74	% Acct - 96%
Section 3: PSLO's	Total 74	% Acct - 89%
Section 3: Origin and External Validation	Total 74	% Acct - 73%
Section 4: Curriculum Map: Scaffolding	Total 74	% Acct - 65%
Section 4: Curriculum Map: Detail of Alignment	Total 74	% Acct - 51%
Section 5: Assessment Cycle: Current Year	Total 74	% Acct - 84%
Section 5: Assessment Cycle: 2 Direct, 1 Indirect	Total 74	% Acct - 78%
Section 5: Assessment Cycle: Multiple Years	Total 74	% Acct - 80%
Section 6: Activity: Valid relationship between outcomes	Total 74	% Acct - 65%
Section 6: Rubric: Valid relationship between outcomes	Total 74	% Acct - 64%
Section 6: Sample: Data collection and research design	Total 74	% Acct - 70%
Section 6: Reliability	Total 74	% Acct - 54%
Section 6: Multiple Sites	Total 74	% Acct - 72%
Section 6: Performance Targets	Total 74	% Acct - 70%
Section 6: Performance Level: Presentation of results	Total 74	% Acct - 80%
Section 6: History of Results	Total 74	% Acct - 45%
Section 6: Faculty Discussion	Total 74	% Acct - 57%
Section 6: Interpretation	Total 74	% Acct - 70%
Section 7: Action Drivers	Total 74	% Acct - 72%
Section 7: Action Specifics	Total 74	% Acct - 73%
Section 7: Accountability	Total 74	% Acct - 65%
Section 7: Planning and Budgeting	Total 74	% Acct - 43%
Section 7: Improvements in Assessment Process	Total 74	% Acct - 68%
Section 8: Closing the Loop	Total 74	% Acct - 43%