



2016-17 Program Assessment Report

Medical Laboratory Science B.S.

Mission, Objectives & Learning Outcomes

Oregon Tech Mission

Oregon Institute of Technology, an Oregon public university, offers innovative and rigorous applied degree programs in the areas of engineering, engineering technologies, health technologies, management, and the arts and sciences. To foster student and graduate success, the university provides an intimate, hands-on learning environment, focusing on application of theory to practice. Oregon Tech offers statewide educational opportunities for the emerging needs of Oregonians and provides information and technical expertise to state, national and international constituents.

Core Theme 1: Applied Degree Programs

Oregon Tech offers innovative and rigorous applied degree programs. The teaching and learning model at Oregon Tech prepares students to apply the knowledge gained in the classroom to the workplace.

Core Theme 2: Student and Graduate Success

Oregon Tech fosters student and graduate success by providing an intimate, hands-on learning environment, which focuses on application of theory to practice. The teaching and support services facilitate students' personal and academic development.

Core Theme 3: Statewide Educational Opportunities

Oregon Tech offers statewide educational opportunities for the emerging needs of Oregon's citizens. To accomplish this, Oregon Tech provides innovative and rigorous applied degree programs to students across the state of Oregon, including high-school programs, online degree programs, and partnership agreements with community colleges and universities.

Core Theme 4: Public Service

Oregon Tech will share information and technical expertise to state, national, and international constituents.

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. Identify, establish, and maintain partnerships with community medical laboratories that provide exceptional educational experiences.

3. Provide learning experiences rich in opportunities that maximize every student's potential to achieve MLS career entry-level competencies.
4. Graduate competent MLS that meet the workforce needs of Oregon and underserved regions of the nation.
5. Contribute to the advancement of MLS pedagogy and growth of the profession.

Program Mission

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 Educational Objectives

Upon completion of the Oregon Tech • OHSU MLS program, a student will have had opportunity to acquire knowledge and skills, and develop professional attributes of a Medical Laboratory Scientist. Consequently, at the time of graduation, graduates will have demonstrated:

- 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.
- Active participation in the development, implementation, and evaluation of test methods
- Responsibility for analysis and decision-making.
- Application of safety and governmental regulations and standards as applied to medical laboratory practice.
- 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.
- Interpersonal and interdisciplinary communication interactions with members of healthcare teams, external relations, customer service and patients.
- Ability to apply knowledge of medical laboratory finance, operations, marketing, human resource management and educational methods.
- Ability to use information technology to effectively and accurately report laboratory-generated information.
- Application of research design and practice principles.

Program Faculty Review

Due to faculty vacancies and faculty turnover, the MLS program did not do a review of program student learning outcomes and objectives. We were just trying to keep the status quo and keep our heads above water.

Fall 2016 - two new faculty (less than 1 year), one faculty vacancy and one faculty retirement (December 2016).

So there were no changes made to these outcomes and objectives.

Showcase Learning Opportunities

Student memberships available in professional organizations - American Society for Clinical Pathology (ASCP) and American Society for Clinical Laboratory Science (ASCLS).

Opportunities to attend the following regional and national conferences:

- Northwest Medical Laboratory Symposium
- ASCLS state (Oregon and Washington) and national conferences
- Opportunity to be the Oregon student representative to the national meeting
- ASCP national conference

Students can choose to participate in teaching a college level course, MLS 107 Medical Detectives, to high school students in the High School Transition (HST) summer program. This is a hands-on career exploration course that is developed and taught by current MLS students under the direction of MLS faculty. This allows students to put the educational methodology that they learned in MLS Foundations I and II courses into practice.

Clinical Externships (total of 16 weeks) at clinical affiliate laboratories throughout the region (Oregon, Washington, Nevada, Idaho and Arizona).

Program History & Vision

Program History

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 Wilsonville, Oregon campus. Here, students admitted to the last year of the degree program (professional year) take coursework that combines a rigorous competency-based science curriculum with community-sponsored clinical training. During the first four terms of the professional year, students complete course work in state-of-the-art-classrooms that include two well-equipped laboratory classrooms 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. 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. Currently, the Department of MLS maintains affiliations with accredited laboratories in Oregon, Washington, Nevada, Idaho, and Arizona. Program graduates are eligible to take the *American Society for Clinical Pathology (ASCP) Medical Laboratory Scientist (MLS)*

national board certification examination* and to pursue career opportunities in various laboratory settings including but not limited to medical, research, and public health.

*The Medical Laboratory Science professional program is accredited by the *National Accrediting Agency for Clinical Laboratory Science (NAACLS)*, 5600 North River Road, Suite 720, Rosemont, Illinois 60018-5119.

Meeting with Advisory Board

Program faculty held a meeting with their Advisory Board during the academic year.

Advisory Board Review

The Advisory Board reviewed the Program Mission and Objectives during the academic year.

Advisory Board Meeting took place on Monday, May 8, 2017 at 1:00-5:00 PM.

Please see meeting minutes attached for discussion notes.

Faculty discussed the things brought up at the advisory meeting at our Department Retreat, Thursday, August 17, 2017. The comments and actions follow.

Feedback on Student Externship Performance:

Lab managers like the competency checklists. We will continue to use those for each externship rotation.

Pipetting skills and knowledge of common tools. Caroline (Foundations I) and Ryan (Immunology and Chemistry) will try to incorporate more pipetting practice and exercise regarding the purpose of common tools into their curriculum.

Student attitudes and appreciation. During externship orientation, Dawn and Caroline tried to reiterate the time and energy it takes for those clinical mentors involved in their training. It was recommended that they send a thank you note after each of their rotations. The program also plans on taking a class picture at graduation, getting student signatures and putting it into a thank you card to send to each clinical affiliate.

Feedback to clinical sites on how they are doing. We discussed how we might share feedback from students to the clinical sites. It is complex and time consuming. We didn't come up with any solutions at this point, but will definitely try to come up with a way to give them feedback in the future.

Addressing the Future Needs of our Clinical Affiliates and the Profession

Laboratory Information System (LIS) component- We discussed the benefits of exposing students to a LIS. At this time, it is felt that it would be cost prohibitive. Since every lab uses a different system, or components designed specifically for them, students will have to relearn the LIS anywhere they go. We will continue to discuss the concepts of hospital information systems, laboratory information systems and middleware.

MLT to MLS online program- This is part of our department strategic plan. Once we are at full faculty again we will be actively putting in place plans to start an online degree completion program.

CLIA- This is currently introduced in both the Foundations series and Clinical Chemistry series.

Critical Thinking- It is our goal to get our students to this point. We will continue to stress this in our courses. It is difficult for students to know how to troubleshoot an instrument when they have not been exposed to that instrument. It is not feasible for us to have all of the instrumentation they will encounter in the medical laboratory on campus. We rely on our clinical affiliates to introduce students to this technology. We will continue to introduce instrumentation in student labs, where feasible and appropriate. We will continue to make sure students are taught the foundational information that is needed to learn how to operate and then troubleshoot laboratory instrumentation.

Interdepartmental communication- We have decided to have our students participate in an interprofessional practice course through OHSU. It meets three times a year (once a term). Our students will not participate until the 2018-19 academic year. Faculty will participate as group facilitators. This year faculty will train as observers and co-facilitators to prepare for full participation next year.

Microbiology Externship Site Shortage Revisited

Everyone agrees that a simulated microbiology rotation on campus is not ideal by any means of the imagination. However, with the dwindling number of medical laboratories that perform microbiology, it seems inevitable that we may have to resort to this in the future. We will continue to try to find clinical externship sites that perform microbiology, but also work on our plan B for the future.

Program Enrollment

Our fall enrollment numbers include students that are out on their externships (graduating in December) and our new cohort of students entering the MLS professional year (15 months).

Our program enrollment is limited by the number of clinical externship sites that we can provide. Even though we have 51 clinical affiliates, labs are not able to take students every year.

Looking strictly at the new incoming cohort, our numbers have increased to our maximum number of students accepted into the program (50). Each year we usually admit 50 students into the professional program and have a list of qualified alternates. As you can see, there are years that not all 50 students that we accept decide to enter the program and we go through our list of qualified alternates.

Academic year	# of Applications	New cohort fall term	Externship students registered for fall term- scheduled to graduate in December	# Graduated in December
2012- 13		35 students	26 students	Class of 2012- 26
2013- 14	125	50 students	35 students	Class of 2013 - 35
2014- 15	102	45 students	49 students	Class of 2014 - 48

2015- 16	93	50 students	45 students	Class of 2015 - 45
2016- 17	82	46 students	47 students	Class of 2016 - 47

The 2013-14 academic year (applications by December 2012) had the highest number of applicants that the program has seen in recent history. It is believed that the number of applicants was higher due to the decline in the economy and the fact that research grant dollars were drying up. As the economy has improved, we have seen a decrease in the number of applicants. With the decrease in qualified applicants, we have also had to decrease the number of students on our alternate list. This last year we went through the entire alternate list, which resulted in a starting cohort of less than 50 students.

There was an issue this year with some misinformation being relayed on to prospective students out of the university admissions department. We will be working with admissions to make sure students are getting the correct information regarding the MLS admissions process.

Attachment 1_Enrollment_5_Year_History_by_Major

Program Graduates

Academic Year Class of	Students in new cohort Fall term	Students graduating	Graduation Rate (%)
2009-10	34 (includes 8 part-time Kaiser students)	26	100
2010-11	34 (includes 8 part-time Kaiser students)	34 (includes 8 part-time Kaiser students)	100
2011-12	27	27	100
2012- 13	35	35	100
2013- 14	50	48 (1 withdrew / 1 died)	96
2014- 15	50	50	100
2015- 16	50	47 (1 withdrew) 1 decelerated to part time and 1 withdrew for USAF, returned- both will graduate with class of 2017	94 (98% if you include the 2 that will graduate 2017)
2016- 17	46	Graduation December 2017	

Our program retention and overall graduation rate for the MLS classes of 2010 – 2016 is 98.2%.

Besides the fact that our students are very motivated and driven, I give credit for the program success to the extremely dedicated MLS faculty and staff. I believe the cohort model also contributes to student success. On the first day of student orientation, I tell students that they competed for a spot in this class, but the competition stops here. We will all work together to assure that all students have the

opportunity to succeed. Students come to rely not only on faculty, but on each other to help them make it through this rigorous program.

The NAACLS benchmark for accredited programs is three consecutive years demonstrating an average of at least 70% of students who have begun the final half of the program go on to successfully graduate from the program.

[Attachment 2_Graduates_10_Year_History_by_Major](#)

Employment Rates and Salaries

The following data is from the Graduate Exit Survey and the MLS program keeping track of students' employment placement.

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. The NAACLS benchmark for accredited programs is three consecutive years demonstrating an average of at least 70% of graduates either find employment in the field/ closely related field or continue their education within one year of graduation

Recently, most of our students have jobs within 3 months of graduation. For example, the Class of 2016 graduated in December 2016. Of the 47 students that graduated, 28 of them had jobs at graduation. By mid-February 44 of the 47 had jobs. Currently 46 of the 47 have jobs and one had decided not to enter the field.

Academic Year Class of	Student Reported Placement Rate within 1 year of Graduation	Average Student Reported Salary	Median Student Reported Salary
2013-2014	97.8%	\$52,083	\$55,000
2014- 2015	100%	\$56,950	
2015- 2016	100%	\$56,688	\$56,000

[Attachment 3_Grad_Data_First_Destination_3_Year_History_by_Major](#)

Pass Rates on Board and Licensure Exam

ASCP Board of Certification (BOC) Exam Scores

	Mean Scaled Score	Total Pass Rate (as of 6/10/17)
OIT/ OHSU MLS Program- Class of 2016	564	97.9%
University Based Programs	507	72%
National – All Programs	494	68%

OIT / OHSU MLS Program

- **Class of 2016 First Time Pass Rate- 91.5%**
- 43 of 47 passed 1st time
- 3 retook exam and passed

- **2010 to September 2017**
- First time pass rate = 92.5%
- Total pass rate= 96.4%

Results of Board or Licensure Exam

Program Pass Rates Meet or Exceed National Average.

[*Attachment 4_ascp_scores_2016_redacted*](#)

Other Program Assessment Data

Yearly Attrition Rate.

NAACLS requires MLS programs to report the yearly attrition rate of the program.

The NAACLS benchmark is three years' consecutive results of graduation rates demonstrating an average at least 70% of students who have begun the final half of the program go on to successfully graduate from the program.

NOTE: 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 of the program to be when students begin the spring or third term of the five terms of the program.

[*Attachment 5_Yearly_Attrition_Rate_2016_17_assessment*](#)

Desired Data

N/A

Closing the Loop

Describe any actions taken and re-assessment done during this academic year in response to assessment findings from prior academic years.

N/A

Changes Implemented

N/A

Assessment Findings

N/A

Program Student Learning Outcomes Assessment Cycle

PROGRAM STUDENT LEARNING OUTCOMES 5-Year Cycle Medical Laboratory Science B.S.	2016-17	2017-18	2018-19	2019-20	2020-21
OIT-BMLS 2016-17.1 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 hematology, chemistry, microbiology, urinalysis, body fluids, molecular diagnostics, phlebotomy, and immunohematology.	ASCP BOC Exam Scores Student Exit Survey	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 449 UA MLS 452 Heme II	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 416 or 417 Chem II or III MLS 474 Parasit	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 453 ImmunoHeme II MLS 420 Immuno	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 424 Hemostasis MLS 422 Molecular
OIT-BMLS 2016-17.2 Proficiency to problem-solve, troubleshoot, and interpret results, and use statistical approaches when evaluating data.	ASCP BOC Exam Scores Student Exit Survey	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 445 Micro II MLS 464 Myc/ Virol	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 449 UA MLS 452 Heme II	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 416 or 417 Chem II or III MLS 474 Parasit	ASCP BOC Exam Scores Student Exit Survey Extern PDE MLS 453 ImmunoHeme II MLS 420 Immuno
OIT-BMLS 2016-17.3 Professional conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and not allowing personal concerns and biases to interfere with the welfare of patients.	Student Exit Survey	Student Exit Survey Extern PDE	Student Exit Survey Extern PDE MLS 432- Found I	Student Exit Survey Extern PDE	Student Exit Survey Extern PDE MLS 432- Found I
OIT-BMLS 2016-17.4 Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory	Student Exit Survey	Student Exit Survey Extern PDE MLS 462 Found II (Education)	Student Exit Survey Extern PDE MLS 462 Found	Student Exit Survey Extern PDE MLS 432- Found I (QA/QC)	Student Exit Survey Extern PDE MLS 462 Found II (Education)

education, fiscal resource management, and appropriate composure under stressful conditions.			II (Fiscal management)		
OIT-BMLS 2016-17.5 Application of safety and governmental regulations and standards as applied to medical laboratory practice.	Student Exit Survey	Student Exit Survey Extern PDE	Student Exit Survey Extern PDE MLS 462 Found II (Gov't Regs)	Student Exit Survey Extern PDE MLS 432 Found I (Safety)	Student Exit Survey Extern PDE MLS 462 Found II (Gov't Regs)
OIT-BMLS 2016-17.6 Effective communication skill to ensure accurate and appropriate information transfer.	Student Exit Survey Oral MLS 416 Written MLS 449	Student Exit Survey Extern PDE MLS courses Oral Written	Student Exit Survey Extern PDE MLS courses Oral Written	Student Exit Survey Extern PDE MLS courses Oral Written	Student Exit Survey Extern PDE MLS courses Oral Written

Assessment Map & Measure

**F – Foundation – introduction of the learning outcome, typically at the lower-division level,
P – Practicing – reinforcement and elaboration of the learning outcome, or
C – Capstone – demonstration of the learning outcome at the target level for the degree**

For each outcome, programs should identify at least 2 direct measures (student work that provides evidence of their knowledge and skills), and 1 indirect measure (student self-assessment of their knowledge and skills) for each outcome.

For every program, data from the Student Exit Survey will be an indirect measure at the capstone level.

OIT-BMLS 2016-17.1 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 hematology, chemistry, microbiology, urinalysis, body fluids, molecular diagnostics, phlebotomy, and immunohematology.	
Course/Event	ASCP Board of Certification Exam
Legend	C – Capstone
Assessment Measure	Direct – Board or Licensure Exam
Criterion	At least a 95% pass rate and 90% first time pass rate
Course/Event	Student Exit Survey
Legend	C – Capstone
Assessment Measure	Indirect – Student Exit Survey

Criterion	When asked how their OIT experience has contributed to this outcome, 90% of graduates list “Very Much” or “Quite a Bit”
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OIT-BMLS 2016-17.2 Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.	
Course/Event	ASCP Board of Certification Exam
Legend	C – Capstone
Assessment Measure	Direct – Board or Licensure Exam
Criterion	At least a 95% pass rate and 90% first time pass rate
Course/Event	Student Exit Survey
Legend	C – Capstone
Assessment Measure	Indirect – Student Exit Survey
Criterion	When asked how their OIT experience has contributed to this outcome, 80% of graduates list “Very Much” or “Quite a bit”

OIT-BMLS 2016-17.6 Effective communication skill to ensure accurate and appropriate information transfer.	
Course/Event	MLS 416
Legend	P – Practice
Assessment Measure	Direct – Oral Presentation
Criterion	90% of students will score proficiency or high proficiency. 100% of students will score some proficiency.
<p>Attachment 6_MLS_416_Case_Presentation_Instructions</p> <p>Attachment 7_2016_17_eslo_communication_rubric</p>	
Course/Event	MLS 449
Legend	P – Practice
Assessment Measure	Direct – Assignment
Criterion	90% of students will score proficiency or high proficiency 100% of students will score some proficiency.
<p>Attachment 8_Instructions_for_Writing_a_Formal_Standard_Operating_Procedure_for_a_Refractometer</p> <p>Attachment 7_2016_17_eslo_communication_rubric</p>	
Course/Event	Student Exit Survey
Legend	C – Capstone
Assessment Measure	Indirect – Student Exit Survey
Criterion	When asked how their OIT experience has contributed to this outcome, 75% of graduates list “Very Much” or “Quite a Bit”

Analysis of Results

OIT-BMLS 2016-17.1 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 hematology, chemistry, microbiology, urinalysis, body fluids, molecular diagnostics, phlebotomy, and immunohematology.	
Criterion	Met
Summary	ASCP BOC Exam first time pass rate was 91.5% (43 of 47 students). The overall pass rate was 97.9% (46 of 47 students). One student has not retaken the exam to date and is not expected to retake the exam. Student Exit survey showed that 94.3% of students felt that their OIT experience contributed "Very Much" or "Quite a Bit" to this outcome
Improvement Narrative	N/A
<p>Attachment 9_mls_class_2016_boc_results</p> <p>Attachment 10_MLS_class_of_2016_exit_survey_Q_25_PSLO</p>	

OIT-BMLS 2016-17.2 Proficiency to problem-solve, troubleshoot, and interpret results, and to use statistical approaches when evaluating data.	
Criterion	Met
Summary	ASCP BOC Exam first time pass rate was 91.5% (43 of 47 students). The overall pass rate was 97.9% (46 of 47 students). One student has not retaken the exam to date and is not expected to retake the exam. Student Exit survey showed that 82.9% of students felt that their OIT experience contributed "Very Much" or "Quite a Bit" to this outcome
Improvement Narrative	N/A
<p>Attachment 9_mls_class_2016_boc_results</p> <p>Attachment 10_MLS_class_of_2016_exit_survey_Q_25_PSLO</p>	

OIT-BMLS 2016-17.6 Effective communication skill to ensure accurate and appropriate information transfer.	
Criterion	Not Met
Summary	Assessment of oral presentation: 100% of students met the standard of proficiency or high proficiency in all categories assessed. Assessment of written assignment: 97.8% of students met the standard of proficiency or high proficiency in all categories assessed. The remaining 2.2 % (one student) scored some proficiency in one category (focus and organization) while scoring proficient or highly proficient in all other categories. Student Exit survey showed that 68.6% of students felt that their OIT experience contributed "Very Much" or "Quite a Bit" to this outcome

Improvement Narrative	<p>- <i>Assessment Method Change:</i> The MLS program is a professional program. Most students transfer into the program as post-baccalaureate students or as seniors from other universities. Since many of their communication skills are developed during their early undergrad careers, it makes sense that they feel that OIT may not have contributed as significantly to their communication proficiency. It would be a better indicator of the desired outcome to assess the student's overall proficiency in the senior exit survey. (Question 24) If we had evaluated this question in the survey, our results would be as follows: Student Exit Survey showed that students rated their effective communication skills to ensure accurate and appropriate information transfer as 97.1% proficient or highly proficient.</p>
<p><i>Attachment 11_LiveText_C1_Assessment_Report_2017_MLS_416_ESLO_Comm_oral</i></p> <p><i>Attachment 12_LiveText_C1_Assessment_Report_2017_MLS_449_ESLO_Comm_written</i></p> <p><i>Attachment 10_MLS_class_of_2016_exit_survey_Q_25_PSLO</i></p> <p><i>Attachment 13_MLS_class_of_2016_exit_survey_Q_24_PSLO</i></p>	

References

Program Assessment Coordinator: Dawn Taylor, Assistant Professor, Medical Laboratory Science

Office of Academic Excellence