Andrews University

Department of Medical Laboratory Sciences

Annual Assessment Report

2015 – 2016

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ABSTRACT: An illustrated report of the assessment activities carried out by the faculty of the Department of Medical Laboratory Sciences during the 2015-2016 academic year. Every attempt has been made to report objective, accurate information. Any errors in reporting are not intentional, and the author welcomes correction when merited.

Medical Laboratory Science (MLS) Program 2015-2016 Assessment Report

I. INTRODUCTION

A. History and Location

Founded in 1874, Andrews University is currently located in Berrien Springs, Michigan and it is the sponsoring institution of the Program for Medical Laboratory Science (MLS). The first Clinical Year Program cohort began in the fall of 1988. The Program's first accreditation by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) was achieved in the spring of 1989, only a few months after the Program accepted the first group of students. The Program remains accredited by NAACLS and currently, is offered through the Department of Medical Laboratory Sciences, housed in Halenz Hall.

The Program functions with one support staff and five MLS full time faculty members, one of which serves as Department Chair, Program Director, and Clinical Coordinator. The Program capacity is 32.

B. Program Organization

The Andrews University Program for Medical Laboratory Science is a 3 + 1 program comprised of three years of undergraduate (pre-clinical) studies plus a one-year (three semesters) clinical year.

The first three years of undergraduate study include general education courses (Andrews Core Experience courses or ACE courses), cognate sciences, and pre-clinical courses. Elective courses are selected in consultation with the faculty advisor and taking into consideration the student's career goals and interests.

MLS majors apply for admissions into the Clinical Year Program during the fall semester of their junior year. The admissions committee typically meets late February or early March. Students admitted to the last year of the degree program (Clinical Year Program) take coursework that combines a rigorous competency-based science curriculum with community-sponsored clinical training. During the first two semesters of the clinical year, students complete course work in modern classrooms, which include a lecture room and two brand new and well-equipped student laboratories.

The three semester of the clinical year are divided as follows: The Fall Semester and two months of the Spring Semester are composed of didactic educational experiences enhanced with hands-on student laboratories on the Berrien Springs campus. Upon successful completion of the on-campus coursework, students are assigned to one or more of the program affiliated laboratories to complete their clinical practicum. During the 20-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 develop further discipline-specific competency under supervision of clinical instructors. Currently, the MLS Department maintains affiliations with accredited laboratories in Alabama, Colorado, Florida, Illinois, Indiana, Kansas, Maryland, Michigan, Ohio, Tennessee, Texas, and Washington DC.

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 hospital laboratories, clinics, forensic laboratories, veterinary clinics; medical, biotechnology, industrial research, and public health laboratories; cytogenetics, cytotechnology, and histology.

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

II. PROGRAM OUTCOMES

A. Enrollment Trends: Applications to the Program have increased over the last three years, peaking for the class of 2015 (Figure 1). The number of admitted students reflects Program capacity and it is not to exceed 32 (Figure 2).

Figure 1. Enrollment Trends

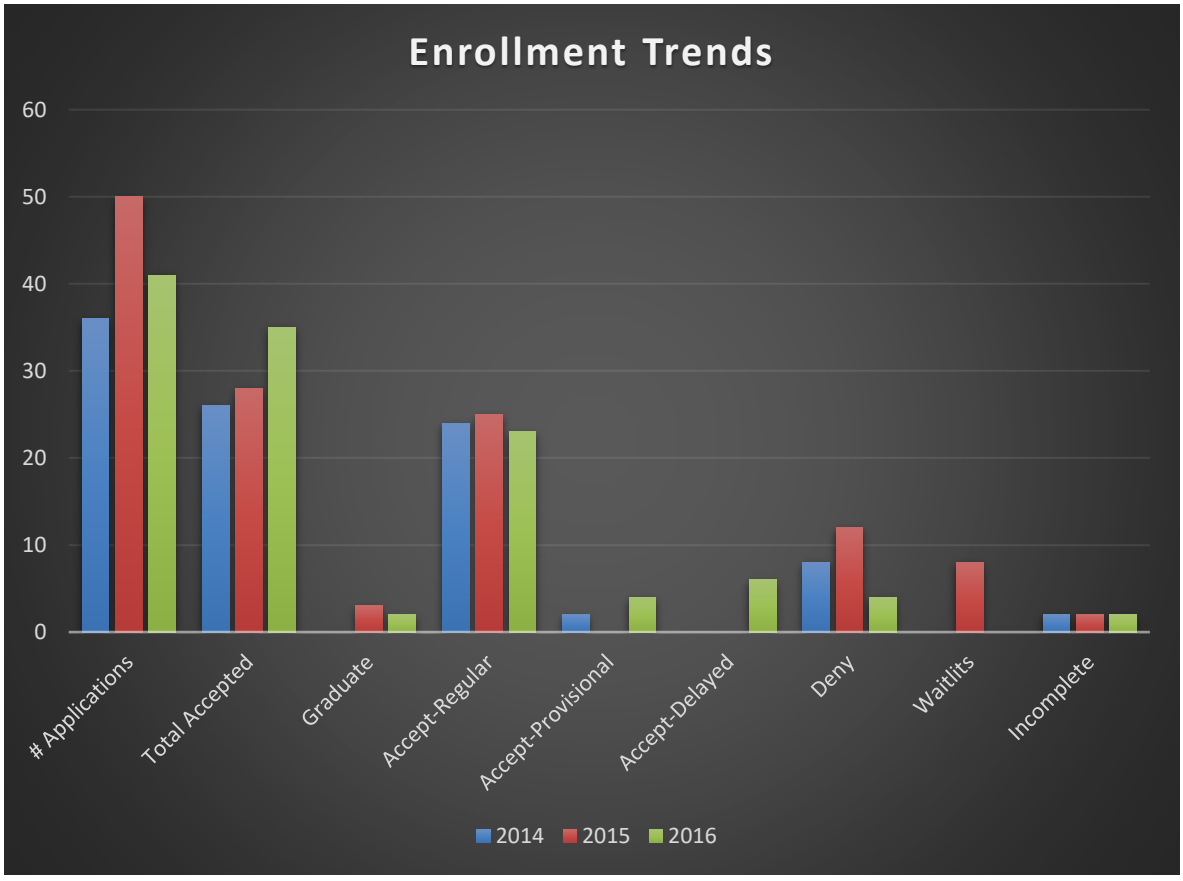
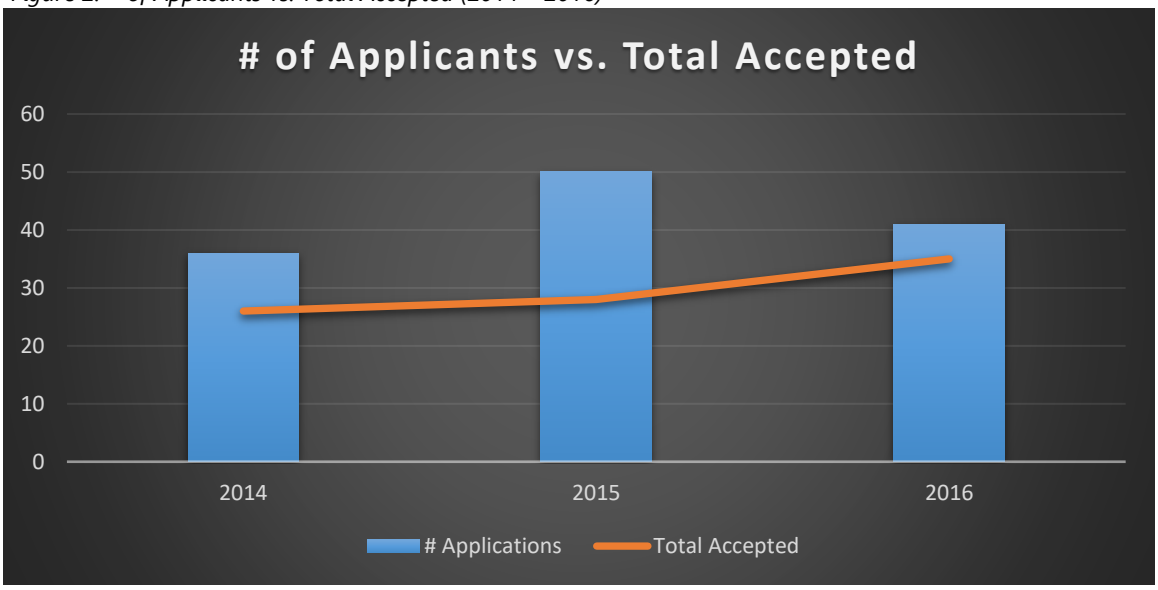


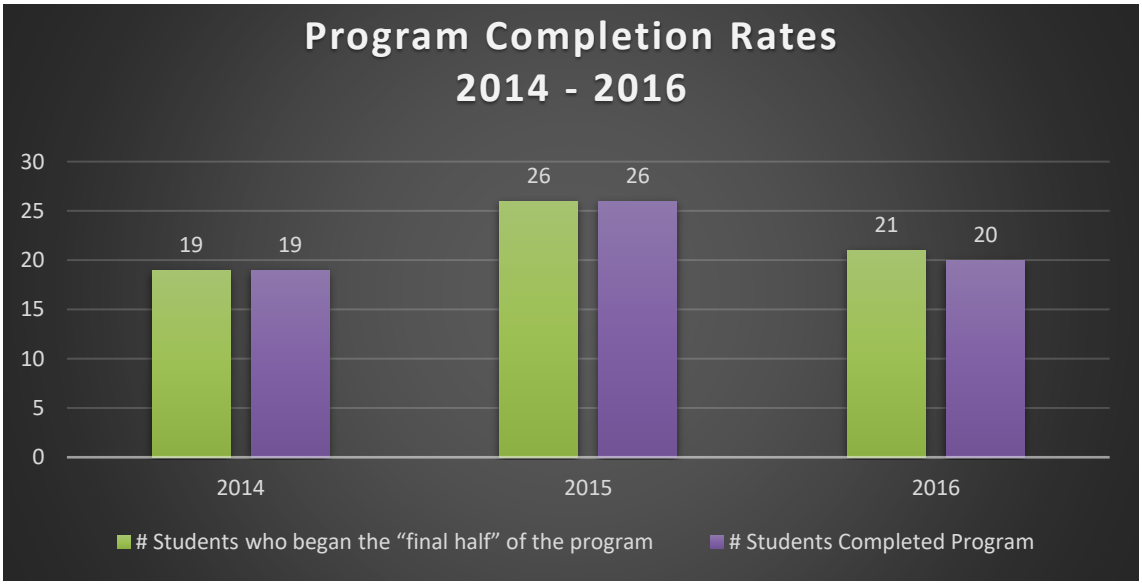
Figure 2. # of Applicants vs. Total Accepted (2014 – 2016)



B. Program Completion Rates: Program completion rates continue to exceed the target of at least 80% (Figure 3). Program completion rates for the last three years are as follow: **19/19** completed the program in 2014; **26/26** completed the program in 2015; **20/21** completed the program in 2016.

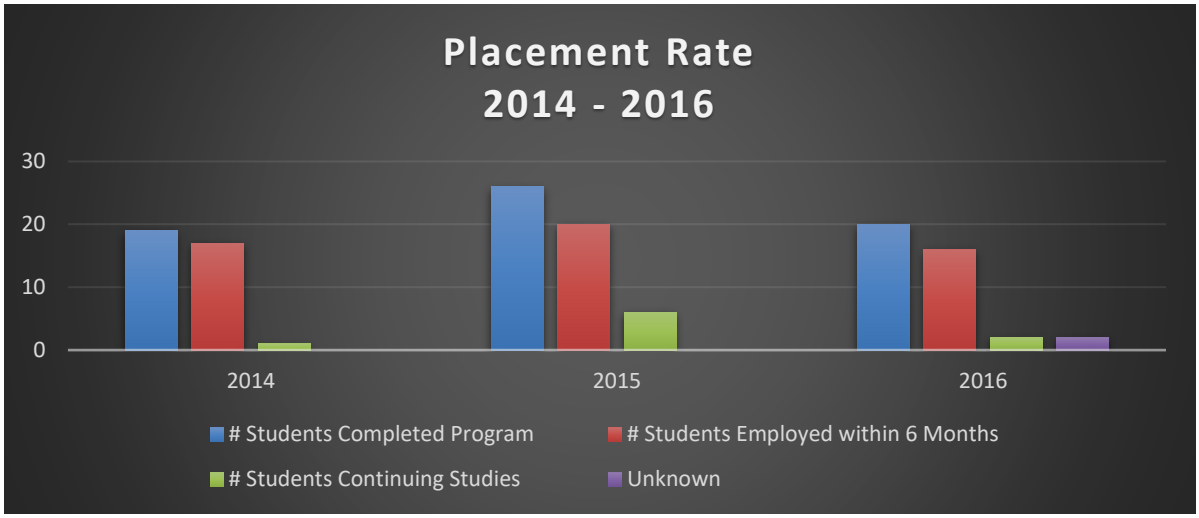
Note: Beginning this reporting cycle, program completion rates are calculated using the NAACLS standard of comparing the number of students that began the "final half" of the program and subsequently completed the program versus those that left the program (voluntarily or involuntarily). The "final half" of the program has been redefined as the clinical practicum portion of the program.

Figure 3. Program Completion Rates (2014 – 2016)



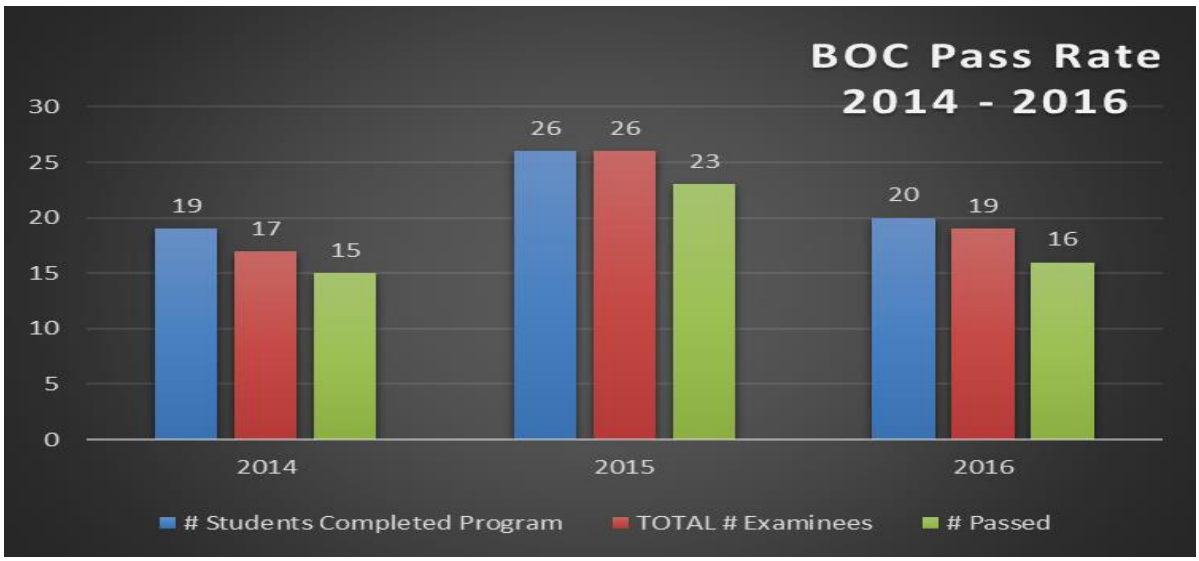
C. Employment Rates: Program employment/placement rates continue to exceed the program target of at least 80% (Figure 4). Of the 20 students that completed the clinical year program, 16 found employment and two continued on to further studies within six months of graduation. The yearly average employment/placement rate for the last three years (2014-2016) are as follows: 95% (n=19) for the class of 2014; 100% (n=26) for the class of 2015; 100% (n=20) for the class of 2016.

Figure 4. Placement Rate (2014 – 2016)



D. Pass Rates on National Board Exam: The three-year (2014 – 2016) average pass rate for program first time examinees is 87% (Table 2). The pass rate for the class of 2016 first time-examinees is 50%, while the pass rate for all attempts is 79%. The exam includes the following seven subtest areas: 1) Transfusion Medicine and Blood Banking (BBNK); 2) Chemistry (CHEM); 3) Hematology and Hemostasis (HEMA); 4) Immunology (IMMU); 5) Laboratory Operations (LO); 6) Microbiology (MICR); and, 7) Urinalysis (UA).

Figure 5. BOC Pass Rate (2014 – 2016)



III. PROGRAM MISSION/PURPOSE, GOALS, AND STUDENT LEARNING OUTCOMES

A. *The MLS program faculty* discussed assessment activities for the 2015-2016 year. The program purpose, objectives, and student learning outcomes were reviewed and affirmed as the following:

Faculty & Staff Commitment

We, the faculty and staff of the Andrews University Program for Medical Laboratory Sciences, as professionals and educators, are committed to providing our students with experiences that prepare them to practice as scholastically accomplished and competent Medical Laboratory Scientists. To that end, we acknowledge our responsibility and pledge our commitment to:

- Demonstrate professionalism through our words and actions
- Provide knowledge-building, skill-developing experiences for all our students
- Create equal opportunity learning environments within which all our students are educated in an atmosphere of fairness and impartiality
- Foster students' commitment to lifelong learning
- Endorse student participation in professional organizations
- Promote student scholarship and professional achievement
- Contribute to the ongoing development and growth of medical laboratory science pedagogy through faculty participation in scholarship, service, and outreach

Program Mission/Purpose

The mission of the Department of Medical Laboratory Sciences (MLS), in harmony with Andrews University and the Seventh-day Adventist Church, is to prepare students for Christian service as Medical Laboratory Scientists. The MLS department encourages faculty in professional, educational, and spiritual growth. The MLS faculty educates students to develop excellence in the professional skills necessary for a life work of service in quality health care and dedication to improving the human condition. MLS graduates will minister to the needs of others by practicing and promoting standards of excellence as medical laboratory science professionals.

Program Goals and General Student Learning Objectives (SLO):

Goal 1: Christian service as MLS professionals.
To prepare students for Christian service as medical laboratory science professionals

Goal 2: MLS Entry-Level Professional Competence
Provide MLS profession-related comprehensive instruction sufficient to meet entry-level MLS employment competencies—including attention to professional growth, personal student-professor interactions, excellent advising, and an emphasis on the spiritual dimensions of the health care field.

SLO 1: MLS Comprehensive Didactic Competency

- Achieve Medical Laboratory Scientist entry-level didactic competency in the following scientific content and as defined by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS):

- Clinical Chemistry
- Hematology & Hemostasis
- Immunology
- Immunohematology & Transfusion Medicine
- Microbiology
- Molecular Diagnostics
- Renal, Urinalysis & Body Fluids
- Laboratory Operations

- Achieve a passing score in the Board of Certification by the ASCP.

SLO 2: Application of MLS Professional Skills

- Achieve Medical Laboratory Scientist entry-level psychomotor, clinical, and professional skills for service to humanity.
- Demonstrate competency to perform a full range of test protocols in the contemporary medical laboratory setting encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including body fluids, chemistry, hematology, immunohematology, immunology, microbiology, molecular diagnostics, urinalysis, and phlebotomy.
- Exhibit proficiency to evaluate clinical data and interpret results, problem solve, troubleshoot, and use statistical approaches when evaluating data.
- Exhibit administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, financial resource management, and appropriate composure under stressful conditions.
- Application of safety and governmental regulations and standards as applied to medical laboratory practice.

SLO 3: Practice Ethics and Professionalism

- Demonstrate ethical and professional behaviors in both didactic and practicum portions of the Program.
- Model the professional traits of an entry-level healthcare practitioner.
- Display professional conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and avoiding personal concerns and biases to interfere with the welfare of patients.
- Demonstrate effective communication skills, including competent written, oral, and visual communication, to ensure accurate and appropriate transfer of information.
- Embrace interprofessional collaborative practice that strengthen the health care team and enhances patient outcomes.

Goal 3: Program Accreditation
Maintain Program accreditation.

<u>Program Learning Outcomes</u>

Upon graduation of the Program for Medical Laboratory Science and initial employment, the Medical Laboratory Science Andrews University graduate should be incline to engage in Christian service as

MLS Professionals and be able to demonstrate entry-level competencies in the following areas of professional practice:

1. Reflect ethical and moral attitudes and principles essential for gaining and maintaining the trust of professional associates, the support of the community, and the confidence of the patient and family;
2. Maintain an attitude of respect for the patient and confidentiality of patients' records and/or diagnoses;
3. Develop and establish procedures for collecting, processing, and analyzing biological specimens and other substances;
4. Perform analytical tests on body fluids, cells, and other clinical substances;
5. Integrate and relate data generated by the various clinical laboratory departments while making decisions regarding possible discrepancies;
6. Confirm abnormal results, verify quality control procedures, and develop solutions to problems concerning the generation of laboratory data;
7. Make decisions concerning the results of quality control and quality assurance measures, and institute proper procedures to maintain accuracy and precision;
8. Establish and perform preventive and corrective maintenance of equipment and instruments as well as identify appropriate sources for repairs;
9. Develop, evaluate, and select new techniques, instruments and methods in terms of their usefulness and practicality within the context of a given laboratory's personnel, equipment, space, and budgetary resources;
10. Demonstrate professional conduct and interpersonal skills with patients, laboratory personnel, other health care professionals, and the public;
11. Establish and maintain continuing education as a function of growth and maintenance of professional competence;
12. Provide leadership in educating other health personnel and the community;
13. Exercise principles of management, safety, and supervision;
14. Apply principles of educational methodology, and
15. Apply principles of current information systems.

IV. PROGRAM ASSESSMENT

A. The three-year cycle assessment for student learning outcomes (SLO) was discussed during the MLS *Program Advisory Committee* meet on April 5, 2016.

B. The MLS faculty affirmed the assessment plan as shown on table 1.

Table 1. Assessment Plan

Department of Medical Laboratory Sciences
Andrews University

Assessment Plan of Medical Laboratory Science Program by Year

NAACLS	Program Student Learning Outcomes (SLO)	Measure	Target	Assessment of SLO by Year		
				2016-2017	2015-2016	2014-2015
Graduation Rates (70%)	**SLO 1:** MLS Comprehensive Didactic Competency	**Direct** *-Clinical Year Didactic Competencies*	1. Clinical-year students will achieve a grade no lower than "C-" in all (clinical year) MLSC-400 level courses. AND 2. Clinical-year students will maintain a minimum GPA of 2.50 during the clinical year.		**Target Partially Met**	**Target Met**
Certification Rates (75%)	**SLO 2:** Application of MLS Professional Skills	**Direct** *-BOC Scores* *-Clinical Evaluation of Student Performance*	BOC Scores: The percentage of graduates that pass the Medical Laboratory Sciences Board of Registry (BOC) by the American Society for Clinical Pathology (ASCP) in a given yearly cycle will be 80% or greater. Clinical Evaluation of Student Performance: Clinical-year students will achieve a grade no lower than "C-" in all clinical practica performance evaluations.		**Target Not Met** The BOC pass rate: AUMLS: 79% Universities: 81%* National: 80.54%* **Target Met** All (n = 20) clinical-year students achieved a grade no lower than "C-" in all clinical practica performance evaluations. Class GPA average: 3.90	**Target Met** The BOC pass rate: AUMLS: 88% Universities: 79.20%* National: 78.85%*
Placement Rates (70%)	**SLO 3:** Practice Ethics and Professionalism	**Indirect** *-Student feedback on placement* *-Employment feedback*	The percentage of graduates that obtained employment or continue their education within the first six months after graduation will be 80% or greater.		**Target Met** 100% of those seeking employment in the Medical Laboratory Sciences field were employed within six months after graduation.	**Target Met** 100% of those seeking employment in the Medical Laboratory Sciences field were employed within six months after graduation.

**First-time examinees*

V. SUMMARY OF 2014-2015 ASSESSMENT ACTIVITIES

A. DIRECT MEASURE: NAACLS Benchmark for accredited programs - Three-years consecutive results of graduate certification rates demonstrate an average of at least 75% pass rate on the ASCP-BOC examinations for those who take the exam within the first year of graduation as calculated by the most recent three-year period. Three-year averages should be calculated using raw student numbers.

- Program action: At the end of spring term 2015, program faculty assessed professional program graduates using results from the American Society for Clinical Pathology (ASCP) Board of Certification (BOC) Medical Laboratory Scientist (MLS) exam.

- Strengths and Weakness in Student Learning Outcomes: The most recent three-years average pass rate on the ASCP BOC MLS exam (Table 2) are well above the NAACLS benchmark of at least 70% (program average pass rate for the last 3 years is 87% for those who take the exam within the first year of graduation. Student pass rates for this cycle was very low. Weakness: while the average mean scaled score in 2014 (461) reflects a drop from 2013 (493), there was a slight improvement in 2015 (463). However, the average mean scaled score drop drastically for the 2016 cycle (Table 3).

- Recommendations for Improvements: Faculty recommended continuous monitoring of data to identify potential trends in sub-score areas. Faculty teaching areas with lower subscores will be reassessing their course content. There were some peculiarities associated with this year's cohort that may explain the low scores (e.g. lower overall GPA in the didactic courses and clinical practicum courses as well as delaying taking the exam). Records for assessment activities are kept in the Office of the MLS Department Chair and may be found in individual student records maintained in the MLS program office.

Table 2. Three-year BOC Pass Rates

	Class of 2014	Class of 2015	Class of 2016
Total number of graduates	20	26	20
Number of graduates that sat for exam within one year of graduation	18	17	19
Number of examinees that passed the exam within first year of graduation	17	15	15
Yearly BOC Pass Rate (%)	94%	88%	79%
3-year average: 87%			

Table 3. Three-year ASCP-BOC Certification Rates

Andrews University Program for Medical Laboratory Science			
CYCLE: 2014*	**Program**	**Universities**	**National**
Number of Examinees	20	2770	3907
Mean Scale Score	461	503	503
Number Passing (%)	15 (75%)	2339 (84.44%)	3274 (83.8%)
Number Failing (%)	5 (25%)	431 (15.56%)	633 (16.2%)
CYCLE: 2015*	**Program**	**Universities**	**National**
Number of Examinees	26	2904	4057
Mean Scale Score	463	489	488
Number Passing (%)	19 (73.08%)	2300 (79.20%)	3199 (78.85%)
Number Failing (%)	7 (26.92%)	604 (20.80%)	858 (21.15%)
CYCLE: 2016*	**Program**	**Universities**	**National**
Number of Examinees	20**	3189	4665
Mean Scale Score	413	505	506
Number Passing (%)	10 (50%)	2588 (81%)	3757 (80.54%)
Number Failing (%)	10 (50%)	601 (19%)	908 (19.46%)

** NOTE: ASCP calculates and reports data for first-time examinees while NAACLS's benchmark includes all examinee attempts. Data in this table is for first time examinees. **One first time examinee from a previous year cohort.*

B. INDIRECT MEASURES:

1. Graduation rates - NAACLS benchmark for graduation rates - Three years consecutive results of graduation rates 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 as calculated by the most recent three year period.

   NOTE: Our program consists of three (3) consecutive semester-terms. Students start in the fall and complete the program at the end of the following summer term. Accordingly, the program determines the final half of the program to be when students begin the third semester or summer semester-term of the program, which consists of the clinical practicum.

   - Program action: At the end of spring term 2015, program faculty assessed program graduation rates.

   - Strengths and Weakness in Program Outcomes: The most recent three-years average for graduation rates (Table 4) are well above the NAACLS benchmark of at least 70% of students who have begun the final half of the program go on to successfully graduate from the program.

   - Recommendations for Improvements: The faculty made no recommendations for improvements. Records on assessment activities are kept in the Office of the MLS Department Chair.

Table 4. Three-year Graduation Rates

	Class of 2014	Class of 2015	Class of 2016
Number of students beginning final half of program	19	26	21
Number of graduates	19	26	20
Graduation Rate (%)	100%	100%	95%
3-year average: 98%			

2. Placement rates - NAACLS benchmark for graduate placement rates - Three years consecutive results of graduate placement rates demonstrating an average of at least 70% of respondent graduates either find employment in the field or a closely related field (for those who seek employment), or continue their education within one year of graduation as calculated by the most recent three year period.

   - Program action: At the end of spring term 2016, program faculty assessed program graduates placement rates.

   - Strengths and Weakness in Program Outcomes: The most recent three-years average for placement rates (Table 5) are well above the NAACLS benchmark of at least 70% of respondent graduates either find employment in the field or a closely related field (for those who seek employment), or continue their education within one year of graduation.
   - Recommendations for Improvements: The faculty made no recommendations for improvements. Records on assessment activities are kept in the Office of the MLS Department Chair.

Table 5. Three-year Placement Rates

	Class of 2014	Class of 2015	Class of 2016
Number of graduates	19	26	20
Number of graduates that gain employment in the field or continued their education within one year of graduation	18	26	18 + 2*
Placement Rate (%)	95%	100%	100%
3-year average: 98%			

**Lost to follow-up are counted as placed.*

3. Attrition rates for the last three consecutive years (Table 6) reflects all students that *began the "final half" of the program and subsequently completed the program versus those that left the program (voluntarily or involuntarily). Beginning on the 2014 cycle, the "final half" of the program has been redefined as progressing into the clinical practicum portion of the program.* Program attrition is typically due to either academic dishonesty and/or inability to meet the progression criteria, which includes maintaining a minimum 2.5 GPA in all portions of the program.

Table 6. Three-year Attrition Rates

	Class of 2014	Class of 2015	Class of 2016
Number of students that began the "final half" of the program	20	26	20
Number of students that did not complete the program	0	0	1
Attrition Rate (%)	0%	0%	4.7%

- Program action: At the end of spring term 2016, program faculty assessed program attrition rates.

- Strengths and Weakness in Program Outcomes: The most recent three-years for attrition rates (Table 6) show low program attrition.

- Recommendations for Improvements: The faculty made no recommendations for improvements. Records on assessment activities are kept in the Office of the MLS Department Chair.

VI. MEDICAL LABORATORY SCIENCE CLINICAL YEAR CURRICULUM

FALL SEMESTER		
Course Number	**Course Title**	**Credits**
MLSC401	Clinical Year Seminar & Research Methodology	0
MLSC411	Hematology & Lab	3
MLSC421	Clinical Immunology, Virology & Molecular Diagnostics & Lab	2
MLSC431	Clinical Bacteriology & Lab	4
MLSC441	Immunohematology & Lab	3
MLSC451	Clinical Chemistry I & Lab	4
	Total Credits	**16**
SPRING SEMESTER		
MLSC400	Specimen Procurement & Processing	1
MLSC401	Clinical Year Seminar & Research Project	1
MLSC412	Hemostasis	1
MLSC432	Clinical Mycology & Parasitology & Lab	2
MLSC442	Transfusion Medicine & Lab	2
MLSC452	Clinical Chemistry II & Lab	2
MLSC461	Body Fluids	1
MLSC475	Medical Laboratory Management Concepts	2
MLSC433	Clinical Microbiology Practicum	4
	Total Credits	**16**
SUMMER SEMESTER		
MLSC413	Clinical Hematology & Hemostasis Practicum	4
MLSC423	Clinical Immunology, Virology & Molecular Diagnostics Practicum	1
MLSC443	Clinical Immunohematology Practicum	4
MLSC453	Clinical Chemistry Practicum	4
MLSC463	Body Fluids Practicum	1
MLSC483	Comprehensive Review & Written Examination	0
MLSC493	Practicum Project	1
	Total Credits	**15**