Clinical Laboratory Science Program Annual Assessment Report 2009-2010

I. Introduction

The Clinical Laboratory Science Program (CLS) serves all admitted OIT CLS degree students, who are each required to take a total of 83 credits in the clinical laboratory disciplines. The program offers courses in hematology, chemistry, immunology, transfusion medicine, urinalysis and body fluids, microbiology, biometry, instrumentation, and laboratory management, in both didactic and student practicum settings. Fall enrollment over the period of 2004 to 2009 has ranged between 45 and 48 students per year. The program has had excellent retention rates over the last six available record years (2004-2009); 137/144 students graduated during that time period. The five year graduation rate based on 2004-2009 data ranged between 19 and 23 CLS graduates per year. Based on 2008 CLS graduates survey, the average salary was $55,033. The 2009 CLS graduate survey was limited, as only 11/21 graduates had received job offers as of January 2010. The average fulltime starting salary for the 11, 2009 graduates, was $51,584. The 2009, lower job offer success, and reduced starting average salary, is possibly related to the continuing recession of 2008-2009.

II. Program, Purpose, Objectives and Student Learning Outcomes

The purpose of the Clinical Laboratory Science Degree is to provide a comprehensive curriculum to prepare students to practice clinical laboratory science/medical technology in diagnostic laboratories and other healthcare-related settings. Successful completion of the Clinical Laboratory Science Program qualifies students to sit for national certification examinations.

Educational Objectives

The program's expectation is to graduate individuals who:

- are professionally competent;
- possess a commitment to lifelong learning;
- exhibit a sense of commitment to the ethical and humane aspects of patient care;
- appreciate the need for research to develop knowledge of health, disease, healthcare management and education;
- recognize the role of the clinical laboratory scientist in the assurance of quality health care.

Student Learning Outcomes (SLO)

The CLS faculty/staff met four times during the Fall 2009 and Winter 2010 terms to review the current program student learning outcomes. After thorough discussion, faculty and staff agreed to continue using the student learning outcomes. The continued version is as follows:

Upon graduation from the program, students will be able to demonstrate:

1. theoretical knowledge and technical skills in the clinical laboratory according to established laboratory standards;
2. error recognition, and the ability to integrate and interpret analytical data and establish a course of action to solve problems;
3. professionalism and ethical behavior;
4. administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management, and appropriate composure under stressful conditions;
5. safe laboratory practice to include maintenance of working environment, adherence to all safety rules and regulations, and appropriate test sample acquisition and handling;

6. communication skills to ensure correct, effective, courteous and appropriate information transfer.

III. Three-Year Cycle for Assessment of Student Learning Outcomes

The faculty agreed that we will have six main outcomes and will assess them based on the three-year cycle shown in Table 1 below.

Learning Outcomes	**Annual**	**07-08**	**'08-09**	**'09-10**	**'10-11**	**'11-12**
1. Theoretical knowledge and technical skills in the clinical laboratory according to established laboratory standards.	✓					
2. Error recognition, and the ability to integrate and interpret analytical data and establish a course of action to solve problems.	✓					
3. Professionalism and ethical behavior.		✓			✓	
4. Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management, and appropriate composure under stressful conditions.			✓			✓
5. Safe laboratory practice to include maintenance of working environment, adherence to all safety rules and regulations, and appropriate test sample acquisition and handling.	✓					
6. Communication skills to ensure correct, effective, courteous and appropriate information transfer.				✓		

Table 1. CLS Program Assessment Cycle

Please refer to Appendix A for a detailed mapping of program student learning outcomes to the CLS curriculum.

IV. Summary of 2009-2010 Assessment Activities

CLS faculty and staff conducted a formal assessment of four student learning outcomes during Fall term 2009 and Winter term of 2010.

Student Learning Outcome #1: Theoretical knowledge and technical skills in the clinical laboratory according to established laboratory standards.

Direct Assessment #1

The CLS faculty and staff conducted an analysis of American Society of Clinical Pathologists Board of Registry (ASCP BOR) certifying exam scores of graduates from 2004-2009 classes. The results of this outcome can be found in Appendix B, Table 1. ASCP BOR exam results included seven laboratory practice areas. These results indicated significant improvement between 2008 and 2009. ASCP BOR 2009 exam scores improved in all practice areas (3 – 15% higher scores). However, the pass rate declined between 2008 and 2009 classes (14/14 & 23/24 respectively).

Direct Assessment #2

Each CLS student must satisfy externship rotation criteria before graduation. Criteria fall into two sections: psychomotor and affective domains of practice in clinical service lab expectations; and written externship exam scores at a satisfactory level for good laboratory practice. Externship exams are given to students at the completion of every laboratory section (chemistry/immunology, hematology, transfusion medicine, microbiology, urinalysis, and specimen processing). The minimum satisfactory exam assessment requires a score of at least 75% for each laboratory section. The 2009 CLS class was the first group in which the minimum passing score was set at 75% in each practice area. Pre-2009 classes required a minimum passing score of 70% in each practice area.

Students who assess at lower than 75% are allowed additional externship time, direction and guidance before taking a second exam in the individual section in which the student did not reach the minimum satisfactory level for good laboratory practice. The minimum satisfactory level for second attempt students is 75%.

CLS faculty review of the results of the 2009 CLS externship scores indicated no apparent deficiencies in any laboratory practice area. The results of this outcome can be found in Appendix B, Table 2. In addition CLS faculty determined that question selection will remain the same, as breadth of questions covered all major topics within each clinical laboratory specialty.

Faculty and staff determined that no action is needed at this time to alter the methods of instruction used to prepare students to sit for the certifying exams and externship exams.

Detailed records of this assessment can be found in the CLS department assessment coordinator's notebook and individual student records in the CLS program office.

Student Learning Outcome #2: Error recognition, and the ability to integrate and interpret analytical data and establish a course of action to solve problems.

The CLS faculty and staff conducted an analysis of externship evaluations in problem recognition and problem solving as scored by clinical site faculty (Appendix B, Table 3). To ensure consistent grading

and interpretation, the CLS clinical coordinator instructed clinical site faculty on scoring criteria and guidelines. For the graduating class of December 2009, no student received an evaluation score that indicated a weakness in student preparation in problem solving and problem recognition. The lowest minimum passing score of three was acquired or exceeded by every student in all four rotation sections. No didactic or student laboratory course changes associated with this SLO were indicated at this time.

Detailed records of this assessment can be found in the CLS department assessment coordinator's notebook, and individual student records maintained in the CLS Program office.

Student Learning Outcome #5: Safe laboratory practice to include maintenance of working environment, adherence to all safety rules and regulations, and appropriate test sample acquisition and handling.

The CLS faculty and staff conducted an analysis of externship evaluations in laboratory techniques and laboratory results as scored by clinical site faculty (Appendix B, table 4). To ensure consistent grading and interpretation, the CLS clinical coordinator instructed clinical site faculty on scoring criteria and guidelines. For the graduating class of December, 2009, no student received an evaluation score that indicated a weakness in student preparation in safe laboratory practice, adherence to safety rules and regulations, and appropriate test sample handling and acquisition.

Detailed records of this assessment can be found in the department assessment coordinator's notebook, and individual student records maintained in the CLS program office.

Student Learning Outcome #6: Communication skills to ensure correct, effective, courteous and appropriate information transfer.

The CLS faculty and staff conducted an analysis of externship evaluations in communication skills, as scored by clinical faculty (Appendix B, Table 5). To ensure consistent grading and interpretation, the CLS clinical coordinator instructed clinical site faculty on scoring criteria and guidelines. Clinical site faculty evaluations were based on: correct utilization of numerical data; and appropriate laboratory information transfer (electronic, written & verbal) as outlined in each facilities 'Standard Operating Procedures' (SOP). For the graduating class of December 2009, no student received an evaluation score that indicated weakness in student communication skills. The lowest minimum passing score of '3' was acquired by every student in all four rotation sections. No didactic or student laboratory course changes associated with this SLO were indicated at this time.

Detailed records of this assessment can be found in the CLS department assessment coordinator's notebook, and individual student records maintained in the CLS program office

V. Evidence of Student Learning

During the 2009-2010 academic year, the Clinical Laboratory Science faculty formally assessed the student learning outcomes summarized below.

Student Learning Outcome #1: Theoretical knowledge and technical skills in the clinical laboratory according to established standards.

Strengths: Externship students performed above expectations for all clinical laboratory practice areas, including chemistry, immunology, hematology, microbiology, transfusion medicine (blood banking), urinalysis, and laboratory operations. On average students scored well above the minimum pass level on national certifying exams and externship exams.

Areas needing improvement: Although 100% of the students passed in both 2007 and 2008 ASCP BOR exams, one student in the 2009 cohort failed to pass the ASCP BOR exam on the first attempt. This same student was successful on a subsequent try. Faculty discussions with this student indicated poor study technique and habits caused the first failure. Improved study methods, combined with tutoring help from her peers, enabled a passing grade on a subsequent attempt. Faculty felt no academic changes were warranted.

Course of Action: Student progress and success will continue to be monitored using attrition rates, decelerating student numbers, and changes in ASCP BOR results. As indicated in the 2008-2009 assessment a minimum of 3 year classes will be evaluated; the data collected for this assessment (2008-2009), and 2 future year classes (2009-2010 & 2010-2011)

Student Learning Outcome #2: Error recognition, and the ability to integrate and interpret analytical data and establish a course of action to solve problems.

Strengths: All externship students performed at or above expectations for recognition of errors in techniques, calculations, and instrument malfunctions. All students utilized learned skills at the appropriate level to determine course of action to solve problems and determine correct solutions.

Areas needing improvement: None at this time.

Student Learning Outcome #5: Safe laboratory practice to include maintenance of working environment, adherence to all safety rules and regulations, and appropriate test sample acquisition and handling.

Strengths: All externship students either met or exceeded expectations, in all clinical areas, for appropriate laboratory technique, which included compliance with facility and established safety policies, maintenance of clean and stocked work areas, documentation of accurate and precise results, interpretation of lab results, and chemical and biological safety protocols (Appendix B, Table 5). Externship coordinators noted that every student was able to acquire and maintain safe laboratory procedures with minimum supervision, thus meeting and exceeding expectations for laboratorians in hospital work environments.

Areas needing improvement: None at this time.

Student Learning Outcome #6: Communication skills to ensure correct, effective, courteous and appropriate information transfer.

Strengths: Evaluations within student externship rotations indicated that all students either met or exceeded expectations for communication skills in electronic, verbal, and written formats, as delineated by the SOPs of each laboratory facility. Externship coordinators noted that every student was able to acquire and utilize correct, effective, and courteous information transfer, with minimum supervision, thus meeting and exceeding expectations for laboratorians in hospital work environments.

Areas needing improvement: None at this time.

VI. Changes Resulting from Assessment

During the 2009-2010 academic year, the Clinical Laboratory Science faculty formally initiated, a change as summarized below.

Student Learning Outcome #1: Theoretical knowledge and technical skills in the clinical laboratory according to established standards.

CLS faculty determined that ASCP BOR exam scores decreased significantly for the 2008 CLS class. In order to better ascertain and improve laboratory skills and knowledge necessary for CLS students to successfully pass the ASCP BOR exam, an increase in minimum score for all CLS externship exams was initiated. Minimum passing scores for externship exams were increased from 70% in 2008, to 75% in 2009. All 2009 CLS students passed at the higher 75% level. The ASCP BOR exam scores for the 2009 CLS graduates increased significantly in all seven laboratory practice areas. The higher, CLS externship exam, minimum score of 75% will be maintained for the next two CLS classes (December 2010 and December 2011 graduates). The future ASCP BOC exam (name change to BOC from BOR initiated in 2010) scores will be evaluated, in combination with the 2009 ASCP BOR exam scores, to determine the effectiveness of the increased minimum score externship exam standard of 75%.

Clinical Laboratory Science Curriculum Map for SLO 1

Theoretical knowledge and technical skills in the clinical laboratory according to established laboratory standards

SLO 1 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	**Biometry**
	CLS 410	**Clinical Microbiology I**
	CLS 420	**Immunology**
	CLS 441	**Practicum: Instrumentation ★**
	CLS 442	**Practicum: Hematology ★**
	CLS 443	**Practicum: Transfusion Medicine ★**
Winter	CLS 411	**Clinical Microbiology II**
	CLS 415	**Clinical Chemistry I**
	CLS 447	**Practicum: Chemistry**
	CLS 448	**Practicum: Immunology/Infectious Serology**
	CLS 449	**Practicum: Urinalysis**
Spring	CLS 412	**Pathophysiology**
	CLS 416	**Clinical Chemistry II**
	CLS 422	**Theories of Molecular Methods**
	CLS 444	***Practicum: Microbiology*** ▲
	CLS 445	***Practicum: Parasitology*** ▲
	CLS 446	***Practicum: Mycology*** ▲
Summer	CLS 419	**Immunohematology**
	CLS 423	**Molecular Techniques**
	CLS 440	**Practicum: Specimen Collection**
	CLS 452	**Practicum: Adv. Hematology Techniques**
	CLS 453	**Practicum: Adv. Transfusion Medicine Techniques**
	CLS 454	**Practicum: Adv. Microbiology Techniques**
	CLS 457	**Practicum: Adv. Chemistry/Immunology Techniques**
	CLS 459	**Practicum: Advanced Urinalysis Techniques**
	CLS 462	Clinical Laboratory Management

Fifth Term – Extended Senior Year

CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Clinical Laboratory Science Curriculum Map for SLO 2

Error recognition, ability to integrate and interpret analytical data, and establish a course of action to solve problems

SLO 2 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	**Biometry**
	CLS 410	**Clinical Microbiology I**
	CLS 420	**Immunology**
	CLS 441	Practicum: Instrumentation ★
	CLS 442	**Practicum: Hematology ★**
	CLS 443	**Practicum: Transfusion Medicine ★**

Winter	CLS 411	**Clinical Microbiology II**
	CLS 415	**Clinical Chemistry I**
	CLS 447	**Practicum: Chemistry**
	CLS 448	**Practicum: Immunology/Infectious Serology**
	CLS 449	**Practicum: Urinalysis**

Spring	CLS 412	Pathophysiology
	CLS 416	**Clinical Chemistry II**
	CLS 422	**Theories of Molecular Methods**
	CLS 444	***Practicum: Microbiology*** ▲
	CLS 445	***Practicum: Parasitology*** ▲
	CLS 446	***Practicum: Mycology*** ▲

Summer	CLS 419	Immunohematology
	CLS 423	**Molecular Techniques**
	CLS 440	Practicum: Specimen Collection
	CLS 452	**Practicum: Adv. Hematology Techniques**
	CLS 453	**Practicum: Adv. Transfusion Medicine Techniques**
	CLS 454	**Practicum: Adv. Microbiology Techniques**
	CLS 457	**Practicum: Adv. Chemistry/Immunology Techniques**
	CLS 459	**Practicum: Advanced Urinalysis Techniques**
	CLS 462	Clinical Laboratory Management

Fifth Term – Extended Senior Year

CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Clinical Laboratory Science Curriculum Map for SLO 3

Professionalism through ethical behavior, attitude, organizational skills, maintenance of patient confidentiality, and respect for coworkers

SLO 3 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	Biometry
	CLS 410	Clinical Microbiology I
	CLS 420	Immunology
	CLS 441	Practicum: Instrumentation ★
	CLS 442	**Practicum: Hematology ★**
	CLS 443	**Practicum: Transfusion Medicine ★**
Winter	CLS 411	Clinical Microbiology II
	CLS 415	Clinical Chemistry I
	CLS 447	**Practicum: Chemistry**
	CLS 448	**Practicum: Immunology/Infectious Serology**
	CLS 449	Practicum: Urinalysis
Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	***Practicum: Microbiology*** ▲
	CLS 445	*Practicum: Parasitology* ▲
	CLS 446	*Practicum: Mycology* ▲
Summer	CLS 419	Immunohematology
	CLS 423	Molecular Techniques
	CLS 440	**Practicum: Specimen Collection**
	CLS 452	**Practicum: Adv. Hematology Techniques**
	CLS 453	**Practicum: Adv. Transfusion Medicine Techniques**
	CLS 454	Practicum: Adv. Microbiology Techniques
	CLS 457	**Practicum: Adv. Chemistry/Immunology Techniques**
	CLS 459	Practicum: Advanced Urinalysis Techniques
	CLS 462	Clinical Laboratory Management

Fifth Term – Extended Senior Year

CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Clinical Laboratory Science Curriculum Map for SLO 4

Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management, and appropriate composure under stressful conditions

SLO 4 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	Biometry
	CLS 410	Clinical Microbiology I
	CLS 420	Immunology
	CLS 441	Practicum: Instrumentation ★
	CLS 442	Practicum: Hematology ★
	CLS 443	Practicum: Transfusion Medicine ★
Winter	CLS 411	Clinical Microbiology II
	CLS 415	Clinical Chemistry I
	CLS 447	Practicum: Chemistry
	CLS 448	Practicum: Immunology/Infectious Serology
	CLS 449	Practicum: Urinalysis
Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	*Practicum: Microbiology* ▲
	CLS 445	*Practicum: Parasitology* ▲
	CLS 446	*Practicum: Mycology* ▲
Summer	CLS 419	Immunohematology
	CLS 423	Molecular Techniques
	CLS 440	Practicum: Specimen Collection
	CLS 452	Practicum: Adv. Hematology Techniques
	CLS 453	Practicum: Adv. Transfusion Medicine Techniques
	CLS 454	Practicum: Adv. Microbiology Techniques
	CLS 457	Practicum: Adv. Chemistry/Immunology Techniques
	CLS 459	Practicum: Advanced Urinalysis Techniques
	CLS 462	**Clinical Laboratory Management**

Fifth Term – Extended Senior Year

	CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Clinical Laboratory Science Curriculum Map for SLO 5

Safe laboratory practice to include maintenance of working environment, abiding by all safety rules and regulations, and appropriate test sample acquisition and handling

SLO 5 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	Biometry
	CLS 410	Clinical Microbiology I
	CLS 420	Immunology
	CLS 441	Practicum: Instrumentation ★
	CLS 442	**Practicum: Hematology ★**
	CLS 443	**Practicum: Transfusion Medicine ★**
Winter	CLS 411	Clinical Microbiology II
	CLS 415	Clinical Chemistry I
	CLS 447	**Practicum: Chemistry**
	CLS 448	**Practicum: Immunology/Infectious Serology**
	CLS 449	**Practicum: Urinalysis**
Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	***Practicum: Microbiology*** ▲
	CLS 445	***Practicum: Parasitology*** ▲
	CLS 446	***Practicum: Mycology*** ▲
Summer	CLS 419	Immunohematology
	CLS 423	Molecular Techniques
	CLS 440	**Practicum: Specimen Collection**
	CLS 452	**Practicum: Adv. Hematology Techniques**
	CLS 453	**Practicum: Adv. Transfusion Medicine Techniques**
	CLS 454	Practicum: Adv. Microbiology Techniques
	CLS 457	**Practicum: Adv. Chemistry/Immunology Techniques**
	CLS 459	Practicum: Advanced Urinalysis Techniques
	CLS 462	Clinical Laboratory Management

Fifth Term – Extended Senior Year

CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Clinical Laboratory Science Curriculum Map for SLO 6

Communication skills to ensure correct, effective, courteous and appropriate information transfer

SLO 6 required curricula are indicated with **Bold Font**

Senior Year

Fall	CLS 406	Biometry
	CLS 410	Clinical Microbiology I
	CLS 420	Immunology
	CLS 441	Practicum: Instrumentation ★
	CLS 442	**Practicum: Hematology ★**
	CLS 443	**Practicum: Transfusion Medicine ★**
Winter	CLS 411	Clinical Microbiology II
	CLS 415	Clinical Chemistry I
	CLS 447	**Practicum: Chemistry**
	CLS 448	**Practicum: Immunology/Infectious Serology**
	CLS 449	**Practicum: Urinalysis**
Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	***Practicum: Microbiology*** ▲
	CLS 445	***Practicum: Parasitology*** ▲
	CLS 446	***Practicum: Mycology*** ▲
Summer	CLS 419	Immunohematology
	CLS 423	Molecular Methods Techniques
	CLS 440	**Practicum: Specimen Collection**
	CLS 452	**Practicum: Adv. Hematology Techniques**
	CLS 453	**Practicum: Adv. Transfusion Medicine Techniques**
	CLS 454	Practicum: Adv. Microbiology Techniques
	CLS 457	**Practicum: Adv. Chemistry/Immunology Techniques**
	CLS 459	Practicum: Advanced Urinalysis Techniques
	CLS 462	Clinical Laboratory Management

Fifth Term – Extended Senior Year

CLS 470	**Clinical Laboratory Externship**

★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Board of Registry CLS Certification Exam Scores (ASCP)

By Subject

Mean Scaled Scores for First-Time Examinees	No. Students	Total Score	BB	Chem	Heme	Imm
2009 OHSU-OIT CLS Pgm	**24**	560 : **1.19**	602 : **1.22**	530 : **1.10**	575 : **1.16**	546 : **1.13**
2009 University-Based	**2424**	472	494	483	494	483
2009 OHSU-OIT CLS Pgm	**24**	560 : **1.18**	602 : **1.23**	530 : **1.09**	575 : **1.16**	546 : **1.13**
2009 National	**3577**	473	491	486	495	482
2008 OHSU-OIT CLS Pgm	**14**	507 : **1.05**	547 : **1.12**	456 : **.95**	528 : **1.07**	464 : **.96**
2008 University-Based	**1843**	485	487	482	493	481
2008 OHSU-OIT CLS Pgm	**14**	507 : **1.04**	547 : **1.12**	456 : **.94**	528 : **1.07**	464 : **.95**
2008 National	**2752**	489	488	486	494	487
2007 OHSU-OIT CLS Pgm	**21**	526 : **1.00**	514 : **1.05**	497 : **1.02**	534 : **1.08**	517 : **1.07**
2007 University-Based	**1753**	526	490	487	496	484
2007 OHSU-OIT CLS Pgm	**21**	526 : **1.07**	514 : **1.05**	497 : **1.01**	534 : **1.08**	517 : **1.06**
2007 National	**2675**	491	491	490	495	488
2006 OHSU-OIT CLS Pgm	**33**	535 : **1.09**	553 : **1.12**	537 : **1.11**	551 : **1.12**	596 : **1.21**
2006 University-Based	**1096**	490	495	482	494	491
2006 OHSU-OIT CLS Pgm	**33**	535 : **1.10**	553 : **1.12**	537 : **1.11**	551 : **1.12**	596 : **1.22**
2006 National	**1740**	488	492	484	493	490
2005 OHSU-OIT CLS Pgm	**18**	604 : **1.21**	612 : **1.25**	584 : **1.19**	628 : **1.24**	592 : **1.19**
2005 University-based	**799**	498	489	491	506	496
2005 OHSU-OIT CLS Pgm	**18**	604 : **1.26**	612 : **1.25**	584 : **1.20**	628 : **1.27**	592 : **1.20**
2005 National	**1266**	481	488	487	496	494
2004 OHSU-OIT CLS Pgm	**23**	539 : **1.08**	547 : **1.09**	505 : **1.02**	530 : **1.05**	600 : **1.19**
2004 University-based	**506**	500	501	491	504	504
2004 OHSU-OIT CLS Pgm	**23**	539 : **1.13**	547 : **1.11**	505 : **1.02**	530 : **1.07**	600 : **1.21**
2004 National	**862**	477	493	497	494	496

Board of Registry CLS Certification Exam Scores (ASCP) (continued)

By Subject

Mean Scaled Scores for First-Time Examinees	No. Students	Total Score	LO	Micro	UA
2009 OHSU-OIT CLS Pgm	**24**	560 : **1.19**	584 : **1.15**	533 : **1.10**	572 : **1.19**
2009 University-Based	**2424**	472	508	485	481
2009 OHSU-OIT CLS Pgm	**24**	560 : **1.18**	584 : **1.14**	533 : **1.10**	572 : **1.17**
2009 National	**3577**	473	511	484	488
2008 OHSU-OIT CLS Pgm	**14**	507 : **1.05**	578 : **1.12**	496 : **1.03**	523 : **1.10**
2008 University-Based	**1843**	485	514	482	475
2008 OHSU-OIT CLS Pgm	**14**	507 : **1.04**	578 : **1.12**	496 : **1.02**	523 : **1.08**
2008 National	**2752**	489	514	486	486
2007 OHSU-OIT CLS Pgm	**21**	526 : **1.00**	548 : **1.08**	523 : **1.07**	607 : **1.24**
2007 University-Based	**1753**	526	509	487	491
2007 OHSU-OIT CLS Pgm	**21**	526 : **1.07**	548 : **1.07**	523 : **1.08**	607 : **1.22**
2007 National	**2675**	491	510	485	497
2006 OHSU-OIT CLS Pgm	**33**	535 : **1.09**	575 : **1.12**	500 : **1.03**	526 : **1.08**
2006 University-Based	**1096**	490	514	485	486
2006 OHSU-OIT CLS Pgm	**33**	535 : **1.10**	575 : **1.12**	500 : **1.03**	526 : **1.07**
2006 National	**1740**	488	512	484	492
2005 OHSU-OIT CLS Pgm	**18**	604 : **1.21**	666 : **1.30**	571 : **1.14**	638 : **1.27**
2005 University-based	**799**	498	511	502	501
2005 OHSU-OIT CLS Pgm	**18**	604 : **1.26**	666 : **1.31**	571 : **1.16**	638 : **1.28**
2005 National	**1266**	481	509	491	497
2004 OHSU-OIT CLS Pgm	**23**	539 : **1.08**	561 : **1.11**	527 : **1.05**	643 : **1.28**
2004 University-based	**506**	500	505	503	504
2004 OHSU-OIT CLS Pgm	**23**	539 : **1.13**	561 : **1.12**	527 : **1.07**	643 **1.27**
2004 National	**862**	477	502	494	508

Graduating Class of December 2009
Externship Section Exams

(Individual and Mean % Score to Nearest Whole %)

Student	Chemistry/ Immunology	Hematology	Microbiology	Transfusion Medicine
A	77	90	94	85
B	97	98	99	96
C	81	85.3	82	76
D	94	97.3	89	81
E	98	85.3	90	92
F	94	93.3	98	84
G	93	83.3	83	87
H	90	78	95	89
I	87	79.3	75	79
J	93	90.7	93	92
K	99	98.7	75	79
L	89	92	94	83
M	91	88	77	83
N	99	92	95	85
O	88	93.3	94	87
P	83	86	93	87
Q	91	97.3	97	91
R	92	86	96	89
S	82	87.3	87	82
T	98	96.7	98	80
U	94	86.7	85	87
Average	**91.0**	**89.7**	**90.0**	**85.4**

Externship exam scores based on comprehensive multiple-choice exams (75-150 questions per exam)

Minimum satisfactory criteria requires an assessment of 75%. Students falling below minimum level were allowed a second attempt. Individiual table values are successful attempt scores.

Graduating Class of December 2009
Externship Evaluation Scores for Problem Recognition (PR) and Problem-Solving (PS)

Student	Chemistry/ Immunology PR/PS	Hematology PR/PS	Microbiology PR/PS	Transfusion Medicine PR/PS
A	3/3	3/3	3/3	3/3
B	3/4	4/4	4/4	4/4
C	4/4	4/4	4/3	4/3
D	4/4	3/4	4/4	4/4
E	3/3	3/3	NA/4	NA/4
F	4/4	4/4	3/3	3/3
G	4/4	3/3	4/4	4/4
H	4/3	3/4	3/3	3/3
I	3/3	4/4	3/3	3/3
J	3/3	4/4	3/3	3/3
K	3/3	4/4	3/4	3/4
L	3/3	4/4	3/3	3/3
M	4/3	3/3	4/3	4/3
N	4/3	3/3	4/4	4/4
O	3/4	3/3	3/3	3/3
P	3/3	3/4	3/4	3/4
Q	4/4	3/3	3/3	3/3
R	3/3	3/3	4/3	4/3
S	4/4	3/3	3/4	3/4
T	3/4	3/3	4/4	4/4
U	3/3	/4	4/4	4/4
Average	**3.5/3.4**	**3.2/3.5**	**3.4/3.5**	**3.5/3.5**

Problem Recognition: Recognizes errors in techniques or calculation results, and/or instrument malfunctions.

Problem Solving: Determines course of action to solve problems and/or suggests correct solution.

Rating Scale:
5 = Exemplary
4 = Above Expectations
3 = Meets Expectations
2 = Needs Improvement
1 = Unacceptable
NA = Not Observed

Graduating Class of December 2009
Externship Evaluation Scores for Laboratory Techniques (LT) and Laboratory Results (LR)

Student	Chemistry/ Immunology LT/LR	Hematology LT/LR	Microbiology LT/LR	Transfusion Medicine LT/LR
A	3/3	3/3	4/4	3/3
B	4/4	4/4	4/4	4/4
C	4/4	4/3	4/4	4/4
D	4/4	4/4	4/4	4/4
E	4/4	4/3	3/4	4/3
F	4/4	3/3	3/3	3/4
G	4/NA	4/4	4/4	3/3
H	3/3	3/3	4/4	4/4
I	3/4	3/4	4/4	4/4
J	3/3	4/4	4/4	4/4
K	3/3	4/4	4/3	4/4
L	3/3	3/3	4/4	3/3
M	4/3	4/4	3/4	4/4
N	4/4	4/4	4/4	3/3
O	3/3	3/4	4/4	3/3
P	3/3	4/4	4/4	3/3
Q	4/4	4/4	4/4	4/4
R	3/3	4/3	4/4	3/3
S	4/3	4/4	4/4	3/3
T	4/	4/4	4/4	4/4
U	4/4	4/4	4/3	4/4
Average	**3.6/3.5**	**3.7/3.7**	**3.7/3.9**	**3.6/3.6**

Laboratory Techniques: Follows verbal/written procedure; uses proper techniques; complies with instructional safety policies. Maintains clean/stocked work area.

Laboratory Results: Obtains accurate/precise results; records, interprets and reports results completely, clearly and accurately. Requires minimum supervision.

Rating Scale:

4 = Above Expectations
3 = Satisfactory/Acceptable
2 = Needs Improvement/Equivocal
1 = Unacceptable
NA = Not Observed

Graduating Class of December 2009
Externship Evaluation Scores for Communication Skills

Student	Chemistry/ Immunology	Hematology	Microbiology	Transfusion Medicine
A	4	4	4	4
B	4	4	4	4
C	4	4	4	3
D	4	4	4	4
E	4	4	4	4
F	4	4	4	4
G	4	3	4	4
H	4	4	4	3
I	3	4	3	4
J	3	4	NA	4
K	4	3	3	4
L	3	3	4	3
M	4	4	4	4
N	4	4	4	4
O	4	3	4	3
P	3	3	3	4
Q	4	4	4	4
R	4	4	4	4
S	4	3	4	4
T	4	4	4	4
U	4	4	4	4
Average	**3.8**	**3.7**	**3.8**	**3.8**

Communication skills
Communication skills to ensure correct, effective, courteous and appropriate information transfer.

Rating Scale:

4 = Above Expectations
3 = Meets Expectations
2 = Needs Improvement
1 = Unacceptable
NA = Not Observed