

Clinical Laboratory Science Program Annual Assessment Report 2011-2012

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 2011 has ranged between 45 and 63 students per year. The program has had excellent retention rates over the last seven available record years (2004-2011); 193/204 students graduated during that time period. The seven year graduation rate based on 2004-2011 data ranged between 19 and 35 CLS graduates per year. The 2011 CLS graduate survey was partially completed, as only 28/35 graduates had received job offers as of March 2012. The average fulltime starting salary for the 28, 2011 graduates, was \$51,107. The 2011 CLS graduate starting salaries reflect a stable compensation level when compared to 2009 and 2010 CLS graduate starting salaries (\$50,752 and \$50,170 respectively).

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 monthly during the Fall 2011 and Winter 2012 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	'12-13
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 2011-2012 Assessment Activities

CLS faculty and staff conducted a formal assessment of four student learning outcomes during Fall term 2011 and Winter term of 2012.

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 BOC) certifying exam scores of graduates from 2005-2011 classes. The results of this outcome can be found in Appendix B, Table 1. ASCP BOC exam results included seven laboratory practice areas. Comparison of 2011 OIT/OHSU CLS Program vs ASCP Board of Certification CLS All University-based exam scores indicated a higher total score average, as well as higher averages within all seven laboratory areas (blood bank, chemistry, hematology, immunology, microbiology, urinalysis and laboratory operations). The first attempt pass was 34/35 (97.1%) in 2011. This was an improvement over the 2010 first attempt pass of 19/22 (86.4%)

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 2011 CLS class was the third 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 2011 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. The number of students requiring second externship exam attempts (5/36 chemistry/immunology; 1/36 hematology; 2/36 blood transfusion medicine) was similar to the previous year CLS classes. 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 CLS graduating class of December 2011, no student received a score of less than “2” (the minimum for “meets expectations”). 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 #4: Administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management, and appropriate composure under stressful conditions.

Administrative skills were assessed by observation of student demeanor, composure, and administrative duties (Appendix B, Table 4). To insure consistent grading and interpretation, the CLS Clinical coordinator instructed clinical site faculty on scoring criteria and guidelines. For the class of 2011, externship site coordinators utilized the evaluation scale as outlined by the CLS Program Clinical Coordinator . For the December 2011 CLS graduating class, no student received an evaluation of less than “2” (the minimum for “meets expectations”). 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 department assessment coordinator’s notebook.

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 5). 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, 2011, no students 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.

V. Evidence of Student Learning

During the 2011-2012 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 (score of 400) on national certifying exams. All CLS student scored above minimum externship scores (75%) on either the 1st or 2nd attempt.

Areas needing improvement: One CLS Class of 2011 student failed to pass the ASCP (BOC) certifying exams. This student was academically challenged in many of the didactic CLS courses. The one student who failed the ASCP (BOC) certification exam has not tried a second attempt, and has failed to contact the CLS Department for guidance. The CLS department will continue attempts to contact the student in the hope of giving academic and professional guidance.

Course of Action: Continuation of the LabCE online Mock exam 3 year study. First year's feedback (December 2011 CLS graduating class) were very supportive of the online LabCE practice exam (9 /10 CLS graduates indicated study enhancement in preparing for the actual ASCP (BOC) certification exam).

The second course of action will be the incorporation of a didactic review textbook chosen by the CLS faculty during the winter 2012 term. The review book will be incorporated into at least one summer 2012 term class, and students will be encouraged to utilize the chosen CLS-practice review book during their clinical externship.

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

Strengths: All CLS externship students in all clinical laboratory sections, performed at or above expectations for professional composure in stressful situations, adherence to institutional and laboratory policies, and effective and courteous communication related to giving and receiving information. Feedback from externship coordinators indicated that all CLS students promoted and practiced management skills at the appropriate level for CLS laboratory practice.

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. 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.

VI. Changes Resulting from Assessment

During the 2011-2012 academic year, the Clinical Laboratory Science faculty formally initiated continued the LabCE online mock exam study.

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

CLS faculty determined that ASCP BOC exam scores were significantly improved for the December 2011 CLS graduating class. The CLS students' feedback, (first year of the three year study) related to the usefulness and qualities of the LabCE online practice exams, reinforced continuation of using the LabCE resource for the remaining two years of the three year study. In addition, a comprehensive CLS review book will become a part of the student curriculum resources beginning summer 2012 term. CLS students will be queried as to the review book's educational attributes at the same time that the Lab CE student input is gathered (1 – 3 months after taking the ASCP(BOC) certification exam). The LabCE and review book evaluation combination will continue for two CLS year classes (2012 & 2013).

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	<i>Practicum: Microbiology ▲</i>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>
Summer	CLS 419	Immunochemistry
	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	<i>Practicum: Microbiology ▲</i>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>

Summer	CLS 419	Immunochemistry
	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
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★▲ 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	<i>Practicum: Microbiology ▲</i>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>

Summer	CLS 419	Immunochemistry
	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
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★▲ 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	<i>Practicum: Microbiology</i> ▲
	CLS 445	<i>Practicum: Parasitology</i> ▲
	CLS 446	<i>Practicum: Mycology</i> ▲

Summer	CLS 419	Immunochemistry
	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
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★▲ 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
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★▲ 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	Immunochemistry
	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
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★▲ Represent ½ class rotation between Fall and Spring terms for each class (year 1)

Board of Certification CLS Exam Scores (ASCP)

Mean Scaled Scores for First-Time Examinees	No. Students	Total Score	BB	Chem	Heme	Imm
2011 OHSU-OIT CLS Pgm	35	<u>581</u> : 1.15	<u>599</u> : 1.20	<u>561</u> : 1.12	<u>599</u> : 1.17	<u>560</u> : 1.13
2011 University-Based	2251	502	500	501	512	494
2011 OHSU-OIT CLS Pgm	35	<u>581</u> : 1.15	<u>599</u> : 1.20	<u>561</u> : 1.12	<u>599</u> : 1.17	<u>560</u> : 1.13
2011 National	3329	502	499	502	510	496
2010 OHSU-OIT CLS Pgm	22	<u>536</u> : 1.09	<u>582</u> : 1.18	<u>481</u> : 0.98	<u>574</u> : 1.16	<u>583</u> : 1.19
2010 University-Based	2276	492	495	492	496	488
2010 OHSU-OIT CLS Pgm	22	<u>536</u> : 1.09	<u>582</u> : 1.18	<u>481</u> : .97	<u>574</u> : 1.15	<u>583</u> : 1.19
2010 National	3296	494	494	495	498	490
2009 OHSU-OIT CLS Pgm	24	<u>560</u> : 1.19	<u>602</u> : 1.22	<u>530</u> : 1.10	<u>575</u> : 1.16	<u>546</u> : 1.13
2009 University-Based	2424	472	494	483	494	483
2009 OHSU-OIT CLS Pgm	24	<u>560</u> : 1.18	<u>602</u> : 1.23	<u>530</u> : 1.09	<u>575</u> : 1.16	<u>546</u> : 1.13
2009 National	3577	473	491	486	495	482
2008 OHSU-OIT CLS Pgm	14	<u>507</u> : 1.05	<u>547</u> : 1.12	<u>456</u> : .95	<u>528</u> : 1.07	<u>464</u> : .96
2008 University-Based	1843	485	487	482	493	481
2008 OHSU-OIT CLS Pgm	14	<u>507</u> : 1.04	<u>547</u> : 1.12	<u>456</u> : .94	<u>528</u> : 1.07	<u>464</u> : .95
2008 National	2752	489	488	486	494	487
2007 OHSU-OIT CLS Pgm	21	<u>526</u> : 1.00	<u>514</u> : 1.05	<u>497</u> : 1.02	<u>534</u> : 1.08	<u>517</u> : 1.07
2007 University-Based	1753	526	490	487	496	484
2007 OHSU-OIT CLS Pgm	21	<u>526</u> : 1.07	<u>514</u> : 1.05	<u>497</u> : 1.01	<u>534</u> : 1.08	<u>517</u> : 1.06
2007 National	2675	491	491	490	495	488
2006 OHSU-OIT CLS Pgm	33	<u>535</u> : 1.09	<u>553</u> : 1.12	<u>537</u> : 1.11	<u>551</u> : 1.12	<u>596</u> : 1.21
2006 University-Based	1096	490	495	482	494	491
2006 OHSU-OIT CLS Pgm	33	<u>535</u> : 1.10	<u>553</u> : 1.12	<u>537</u> : 1.11	<u>551</u> : 1.12	<u>596</u> : 1.22
2006 National	1740	488	492	484	493	490
2005 OHSU-OIT CLS Pgm	18	<u>604</u> : 1.21	<u>612</u> : 1.25	<u>584</u> : 1.19	<u>628</u> : 1.24	<u>592</u> : 1.19
2005 University-based	799	498	489	491	506	496
2005 OHSU-OIT CLS Pgm	18	<u>604</u> : 1.26	<u>612</u> : 1.25	<u>584</u> : 1.20	<u>628</u> : 1.27	<u>592</u> : 1.20
2005 National	1266	481	488	487	496	494

Board of Certification CLS Exam Scores (ASCP) (continued)
By Subject

Mean Scaled Scores for First-Time Examinees	No. Students	Total Score	LO	Micro	UA
2011 OHSU-OIT CLS Pgm	35	<u>581</u> : 1.15	<u>598</u> : 1.15	<u>560</u> : 1.12	<u>617</u> : 1.25
2011 University-Based	2251	502	519	499	495
2011 OHSU-OIT CLS Pgm	35	<u>581</u> : 1.15	<u>598</u> : 1.15	<u>560</u> : 1.12	<u>617</u> : 1.23
2011 National	3329	502	522	498	502
2010 OHSU-OIT CLS Pgm	22	<u>536</u> : 1.09	<u>542</u> : 1.05	<u>505</u> : 1.04	<u>526</u> : 1.08
2010 University-Based	2276	492	518	487	485
2010 OHSU-OIT CLS Pgm	22	<u>536</u> : 1.09	542 : 1.04	<u>505</u> : 1.04	<u>526</u> : 1.07
2010 National	3577	494	519	487	493
2009 OHSU-OIT CLS Pgm	24	<u>560</u> : 1.19	<u>584</u> : 1.15	<u>533</u> : 1.10	<u>572</u> : 1.19
2009 University-Based	2424	472	508	485	481
2009 OHSU-OIT CLS Pgm	24	<u>560</u> : 1.18	584 : 1.14	<u>533</u> : 1.10	<u>572</u> : 1.17
2009 National	3577	473	511	484	488
2008 OHSU-OIT CLS Pgm	14	<u>507</u> : 1.05	<u>578</u> : 1.12	<u>496</u> : 1.03	<u>523</u> : 1.10
2008 University-Based	1843	485	514	482	475
2008 OHSU-OIT CLS Pgm	14	<u>507</u> : 1.04	<u>578</u> : 1.12	<u>496</u> : 1.02	<u>523</u> : 1.08
2008 National	2752	489	514	486	486
2007 OHSU-OIT CLS Pgm	21	<u>526</u> : 1.00	<u>548</u> : 1.08	<u>523</u> : 1.07	<u>607</u> : 1.24
2007 University-Based	1753	526	509	487	491
2007 OHSU-OIT CLS Pgm	21	<u>526</u> : 1.07	<u>548</u> : 1.07	<u>523</u> : 1.08	<u>607</u> : 1.22
2007 National	2675	491	510	485	497
2006 OHSU-OIT CLS Pgm	33	<u>535</u> : 1.09	<u>575</u> : 1.12	<u>500</u> : 1.03	<u>526</u> : 1.08
2006 University-Based	1096	490	514	485	486
2006 OHSU-OIT CLS Pgm	33	<u>535</u> : 1.10	<u>575</u> : 1.12	<u>500</u> : 1.03	<u>526</u> : 1.07
2006 National	1740	488	512	484	492
2005 OHSU-OIT CLS Pgm	18	<u>604</u> : 1.21	<u>666</u> : 1.30	<u>571</u> : 1.14	<u>638</u> : 1.27
2005 University-based	799	498	511	502	501
2005 OHSU-OIT CLS Pgm	18	<u>604</u> : 1.26	<u>666</u> : 1.31	<u>571</u> : 1.16	<u>638</u> : 1.28
2005 National	1266	481	509	491	497

Appendix B, Table 1, Part B

Graduating Class of December 2011
Externship
Section Exams
(Individual and Mean % Score to Nearest Whole %)

Student	Chemistry/ Immunology	Hematology	Microbiology	Transfusion Medicine
A	86.70	98.00	92.80	76.00
B	85.30	91.30	85.60	91.00
C	75.30	79.30	84.80	81.00
D	78.70	76.70	92.00	89.00
E	75.30	87.30	95.20	84.00
F	98.00	99.30	98.40	91.00
G	96.00	86.00	97.60	81.00
H	88.70	98.70	98.40	84.00
I	89.30	97.30	89.60	87.00
J	86.70	86.70	93.60	76.00
K	72.7/86.7	66.0/88.0	97.60	70.0/84.0
L	81.30	85.30	92.80	73.0/76.0
M	82.70	98.70	98.40	91.00
N	82.00	94.70	92.80	83.00
O	93.30	84.00	92.00	89.00
P	86.00	88.70	96.80	91.00
Q	90.00	94.00	92.80	83.00
R	75.30	76.70	80.00	73/79
S	88.00	90.00	91.20	91.00
T	72.7/93.3	95.30	96.00	91.00
U	75.30	92.70	93.60	76.00
V	88.00	98.00	99.20	81.00
W	74.0/93.3	84.70	92.00	83.00
X	85.30	92.70	95.20	89.00
Y	70.7/91.3	91.30	96.80	89.00
Z	94.70	97.30	94.40	91.00
AA	96.00	98.00	98.40	91.00
BB	70.6/77.3	78.00	88.80	75.00
CC	85.30	84.00	94.40	79.00
DD	84.70	93.30	86.40	79.00
EE	89.30	97.30	99.20	83.00
FF	96.00	96.00	96.80	89.00
GG	82.70	89.30	86.40	83.00
HH	93.30	91.30	97.60	89.00
II	91.30	94.70	95.20	81.00
JJ	84.00	96.70	92.80	90.00
Average	86.60	90.95	93.49	85.06

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. Individual table values are successful attempt scores.

**Graduating Class of December 2011
Externship Evaluation Scores for Problem Recognition (PR)
and Problem-Solving (PS)**

Student	Hematology		Microbiology		Chemistry/ Immunology		Transfusion Medicine	
	PR/PS	PR/PS	PR/PS	PR/PS	PR/PS	PR/PS	PR/PS	PR/PS
A	2.4	2.0	2.6	3.0	2.1	2.0	2.0	2.0
B	2.5	2.5	2.6	2.5	3.0	2.5	2.9	2.8
C	2.5	2.4	2.9	2.0	2.8	2.5	3.0	3.0
D	3.0	3.0	3.0	3.0	3.0	3.0	2.4	2.0
E	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
F	2.0	2.5	3.0	3.0	2.7	3.0	2.0	2.0
G	2.7	3.0	2.0	2.0	3.0	3.0	2.1	2.0
H	2.0	2.0	2.9	2.0	2.0	2.0	2.6	2.5
I	3.0	3.0	3.0	3.0	2.6	2.5	3.0	3.0
J	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0
K	3.0	3.0	3.0	3.0	2.4	2.4	3.0	3.0
L	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
M	2.2	2.2	2.0	2.0	2.0	2.0	2.3	2.5
N	3.0	3.0	3.0	2.5	3.0	3.0	2.1	2.0
O	2.4	2.4	2.6	2.6	2.5	2.5	3.0	3.0
P	2.7	3.0	2.4	2.0	2.5	2.4	3.0	3.0
Q	2.9	2.5	2.4	2.4	2.0	NA	2.1	2.0
R	3.0	3.0	2.9	2.5	2.9	3.0	2.9	2.5
S	2.4	2.5	2.0	2.0	2.4	2.0	3.0	3.0
T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
U	3.0	3.0	2.0	2.0	2.4	2.0	2.0	2.0
V	3.0	3.0	2.4	2.5	3.0	3.0	2.0	2.0
W	3.0	3.0	3.0	3.0	2.1	2.0	3.0	3.0
X	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Y	3.0	3.0	2.7	2.5	3.0	2.0	2.6	2.5
Z	2.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0
AA	2.0	2.0	2.1	2.5	2.0	2.0	2.0	2.0
BB	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0
CC	2.9	3.0	2.7	2.0	2.1	2.0	2.1	2.0
DD	2.6	2.1	2.1	2.0	2.6	2.5	3.0	3.0
EE	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
FF	2.4	2.3	2.6	2.5	2.4	2.3	2.8	3.0
GG	3.0	3.0	2.4	NA	2.0	2.5	3.0	3.0
HH	3.0	3.0	3.0	3.0	2.9	3.0	2.1	2.0
II	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	2.7	2.7	2.6	2.5	2.6	2.5	2.6	2.6

*Rating Scale:
3 = Exceeds Expectations
2 = Meets Expectations
1 = Below Expectations
NA = Not Observed*

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.

**Graduating Class of December 2011
Externship Evaluation Scores for Administrative Attributes of
Professional Performance (PP), Institutional Policies (IP) and Communication Skills(CS)**

Student	Hematology			Microbiology			Chemistry/ Immunology			Transfusion Medicine		
	PP	IP	CS	PP	IP	CS	PP	IP	CS	PP	IP	CS
A	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0
B	3.0	3.0	3.0	2.5	2.5	2.5	3.0	2.0	3.0	3.0	3.0	3.0
C	3.0	2.0	2.0	2.0	2.0	2.0	2.5	2.0	2.5	3.0	3.0	3.0
D	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
E	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
F	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
G	3.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0
H	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0
I	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0
J	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
K	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
L	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
M	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
N	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
O	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
P	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
Q	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
R	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
S	NA	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
U	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
V	2.5	2.5	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
W	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0
X	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Y	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
Z	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
AA	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
BB	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
CC	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0
DD	2.5	2.7	2.7	2.0	2.0	2.0	2.5	2.5	2.5	3.0	3.0	3.0
EE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
FF	3.0	2.5	2.5	2.7	2.7	2.7	2.7	2.7	2.7	3.0	3.0	3.0
GG	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.5	3.0	3.0	3.0	3.0
HH	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
II	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0
Average	2.8	2.7	2.8	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6

Rating Scale:
3 = Exceeds Expectations
2 = Meets Expectations
1 = Below Expectations
NA = Not Observed

Administrative Attributes: Demonstrates professional composure in stressful situation (PP), adheres to management and general policies (IP) and communicates to others effectively and courteously (CS).

**Graduating Class of December 2011
Externship Evaluation Scores for Laboratory Performance
(LT) and Laboratory Results (LR)**

Student	Hematology		Microbiology		Chemistry/ Immunology		Transfusion Medicine	
	LT/LR	LT/LR	LT/LR	LT/LR	LT/LR	LT/LR	LT/LR	LT/LR
A	2.6	3.0	2.5	3.0	2.3	2.0	3.0	2.5
B	3.0	3.0	2.7	2.5	2.6	2.4	3.0	3.0
C	2.5	2.2	2.2	2.0	2.9	2.3	3.0	3.0
D	3.0	3.0	2.0	2.0	3.0	3.0	2.3	2.2
E	3.0	3.0	3.0	2.8	3.0	3.0	3.0	3.0
F	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.2
G	2.8	2.8	2.0	2.0	3.0	3.0	2.0	2.0
H	2.0	2.0	2.0	2.2	2.0	2.0	3.0	3.0
I	3.0	3.0	2.2	3.0	2.2	2.2	3.0	3.0
J	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
K	3.0	3.0	3.0	3.0	2.4	2.0	3.0	3.0
L	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
M	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0
N	3.0	3.0	3.0	3.0	3.0	3.0	2.3	2.0
O	2.2	2.0	2.5	2.5	2.2	2.5	2.7	2.8
P	3.0	2.6	2.4	2.0	2.7	2.0	3.0	3.0
Q	3.0	3.0	2.0	2.0	2.0	2.0	2.2	2.4
R	3.0	2.8	3.0	2.6	2.8	3.0	2.6	2.2
S	2.0	2.0	2.0	2.0	2.1	2.0	3.0	3.0
T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
U	3.0	3.0	2.0	2.0	2.6	2.2	2.4	2.0
V	3.0	3.0	2.0	2.6	3.0	3.0	2.3	2.0
W	3.0	3.0	3.0	3.0	2.0	2.2	3.0	3.0
X	2.8	2.6	3.0	3.0	2.0	2.0	3.0	3.0
Y	3.0	3.0	3.0	3.0	3.0	3.0	2.8	2.8
Z	3.0	3.0	2.2	2.0	3.0	2.0	3.0	3.0
AA	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.0
BB	3.0	3.0	3.0	3.0	3.0	2.4	3.0	3.0
CC	3.0	2.8	3.0	3.0	2.0	2.0	3.0	3.0
DD	2.7	2.6	2.0	2.0	2.5	2.5	3.0	2.8
EE	3.0	3.0	3.0	3.0	2.3	3.0	3.0	3.0
FF	2.7	2.7	2.8	2.7	2.7	2.6	3.0	3.0
GG	3.0	3.0	2.0	2.0	2.6	2.2	3.0	3.0
HH	2.8	2.8	3.0	3.0	3.0	3.0	2.0	2.0
II	2.8	3.0	2.8	3.0	2.8	2.5	3.0	3.0
Average	2.8	2.7	2.5	2.5	2.5	2.4	2.7	2.6

<p><i>Rating Scale:</i> 3 = Exceeds Expectations 2 = Meets Expectations 1 = Below Expectations NA = Not Observed</p>
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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.