

# **Clinical Laboratory Science Program Annual Assessment Report 2010-2011**

## **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 2010 has ranged between 45 and 60 students per year. The program has had excellent retention rates over the last six available record years (2004-2010); 159/170 students graduated during that time period. The six year graduation rate based on 2004-2010 data ranged between 19 and 23 CLS graduates per year. Based on 2009 CLS graduates survey, the average salary was \$50,752. The 2010 CLS graduate survey was partially completed, as only 16/22 graduates had received job offers as of March 2011. The average fulltime starting salary for the 16, 2010 graduates, was \$50,170. The 2010, lower job offer success, and reduced starting average salary, is possibly related to the continuing recession.

## **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 the national certification examination.

### **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 2010 and Winter 2011 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 to 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 2010 and Winter term of 2011.

##### **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 2005-2010 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 2010 OIT/OHSU CLS Program vs ASCP Board of Certification CLS All University-based exam scores indicated a lower total score average, as well as lower averages within five of seven laboratory areas (blood bank, chemistry, microbiology, urinalysis and laboratory operations). In addition the 2010 first attempt pass rate fell relative to 2009 and 2008 classes (19/22, 23/24 & 14/14 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 2010 CLS class was the second 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 2010 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 (3/22 chemistry/immunology; 2/22 hematology; 1/22 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 graduating class of December 2010, four students received an evaluation score of “2” in one or more sections that indicated a weakness in student preparation in problem solving and problem recognition. Equivocal scores of “2” automatically triggered communication between site mentor, section academic faculty and student. In each case the academic faculty and site mentor upgraded the score to a passing level based on unique circumstances that erroneously had a negative impact on student performance and/or evaluation. These students received satisfactory scores when the evaluations were conducted utilizing criteria that were disconnected from non-student performance mentor-associated misunderstandings. The lowest minimum passing score of “3” or a scoring equivalent 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 #3: Professionalism and ethical behavior.**

The CLS faculty and staff conducted an analysis of externship evaluations in personal responsibility and professional attributes as scored by clinical site faculty (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 2010, one student received an evaluation score of “2” that indicated weakness in professional attributes. Discussions between CLS Program Director, section Academic Faculty, and site mentor, led to a correction of the score to “meets expectations” when it became evident that the lower score was a reflection of student and mentor personality conflict, and not a lack of student professional attributes. Thus the lowest minimum passing score of “3” was acquired or exceeded by every student in all four 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 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, 2010, 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 2010-2011 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 students scored above minimum externship scores (75%) on either the 1<sup>st</sup> or 2<sup>nd</sup> attempt.

Areas needing improvement: Three CLS Class of 2010 students failed to pass the ASCP (BOC) certifying exams. These three students were academically challenged in many of the didactic CLS courses. Two of these students were given academic guidance, a study plan, and access to tutors to prepare for a second ASCP (BOC) certifying exam attempt. Both students passed on the second attempt. The third student has made no contact with the CLS Program and has not taken another certifying exam. The CLS Program's attempt to contact this student has repeatedly failed.

Course of Action: In order to help students study before taking the certifying exam two courses of action will be initiated for the next CLS class. The first course of action will utilize practice on-line mock certifying tests that are commercially available. These practice tests will be mandatory for all students. They will be taken during the summer term before the start of their externships. The second course of action will be formulation by CLS faculty of individualized study outlines for each student that fails to successfully pass the mock certifying online computer exams.

### **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 #3: Professionalism and ethical behavior.**

Strengths: All externship students, in all clinical laboratory sections, performed at or above expectations for personal responsibility; this included promptness, dependability, and following institutional and laboratory practice policies. Minimum benchmarks for professional attributes were met or exceeded for integrity and ethical behavior. Feedback from externship coordinators indicated that all students promoted and practiced at high level all the indications for promoting pleasant work atmosphere, cooperation, volunteerism, acceptance of constructive criticism, seeking out appropriate learning opportunities, co-worker help, and respect for patient dignity.

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.

## **VI. Changes Resulting from Assessment**

During the 2010-2011 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 BOC exam scores decreased significantly for the 2010 CLS class. In order to better ascertain and improve laboratory skills and knowledge necessary for CLS students to successfully pass the ASCP BOC exam, students will take online mock certifying exams in the Summer term prior to starting their externships. Two commercial mock testing sources will be evaluated: ASCP (BOC) Practice Exams, and LabCE Practice Exams. One will be chosen for use. In combination with maintaining a higher externship exam standard of 75%, a correlation with future class ASCP (BOC) certifying exam scores will be ascertained. Effectiveness of this approach will utilize results over a minimum of 3 year classes (2011, 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	<b>Biometry</b>
	CLS 410	<b>Clinical Microbiology I</b>
	CLS 420	<b>Immunology</b>
	CLS 441	<b>Practicum: Instrumentation ★</b>
	CLS 442	<b>Practicum: Hematology ★</b>
	CLS 443	<b>Practicum: Transfusion Medicine ★</b>

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

Spring	CLS 412	<b>Pathophysiology</b>
	CLS 416	<b>Clinical Chemistry II</b>
	CLS 422	<b>Theories of Molecular Methods</b>
	CLS 444	<i>Practicum: Microbiology ▲</i>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>

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

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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 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	<b>Biometry</b>
	CLS 410	<b>Clinical Microbiology I</b>
	CLS 420	<b>Immunology</b>
	CLS 441	Practicum: Instrumentation ★
	CLS 442	<b>Practicum: Hematology ★</b>
	CLS 443	<b>Practicum: Transfusion Medicine ★</b>

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

Spring	CLS 412	Pathophysiology
	CLS 416	<b>Clinical Chemistry II</b>
	CLS 422	<b>Theories of Molecular Methods</b>
	CLS 444	<i>Practicum: Microbiology ▲</i>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>

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

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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	<b>Practicum: Hematology ★</b>
	CLS 443	<b>Practicum: Transfusion Medicine ★</b>

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

Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	<b>Practicum: Microbiology ▲</b>
	CLS 445	<i>Practicum: Parasitology ▲</i>
	CLS 446	<i>Practicum: Mycology ▲</i>

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

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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	<b>Clinical Laboratory Management</b>

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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	<b>Practicum: Hematology ★</b>
	CLS 443	<b>Practicum: Transfusion Medicine ★</b>

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

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

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

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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	<b>Practicum: Hematology ★</b>
	CLS 443	<b>Practicum: Transfusion Medicine ★</b>

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

Spring	CLS 412	Pathophysiology
	CLS 416	Clinical Chemistry II
	CLS 422	Theories of Molecular Methods
	CLS 444	<i><b>Practicum: Microbiology ▲</b></i>
	CLS 445	<i><b>Practicum: Parasitology ▲</b></i>
	CLS 446	<i><b>Practicum: Mycology ▲</b></i>

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

### Fifth Term – Extended Senior Year

CLS 470	<b>Clinical Laboratory Externship</b>
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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
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
2010 OHSU-OIT CLS Pgm 2010 University-Based	22 2276	<u>536</u> : 1.09 492	<u>542</u> : 1.05 518	<u>505</u> : 1.04 487	<u>526</u> : 1.08 485
2010 OHSU-OIT CLS Pgm 2010 National	22 3577	<u>536</u> : 1.09 494	542 : 1.04 519	<u>505</u> : 1.04 487	<u>526</u> : 1.07 493
2009 OHSU-OIT CLS Pgm 2009 University-Based	24 2424	<u>560</u> : 1.19 472	<u>584</u> : 1.15 508	<u>533</u> : 1.10 485	<u>572</u> : 1.19 481
2009 OHSU-OIT CLS Pgm 2009 National	24 3577	<u>560</u> : 1.18 473	584 : 1.14 511	<u>533</u> : 1.10 484	<u>572</u> : 1.17 488
2008 OHSU-OIT CLS Pgm 2008 University-Based	14 1843	<u>507</u> : 1.05 485	<u>578</u> : 1.12 514	<u>496</u> : 1.03 482	<u>523</u> : 1.10 475
2008 OHSU-OIT CLS Pgm 2008 National	14 2752	<u>507</u> : 1.04 489	<u>578</u> : 1.12 514	<u>496</u> : 1.02 486	<u>523</u> : 1.08 486
2007 OHSU-OIT CLS Pgm 2007 University-Based	21 1753	<u>526</u> : 1.00 526	<u>548</u> : 1.08 509	<u>523</u> : 1.07 487	<u>607</u> : 1.24 491
2007 OHSU-OIT CLS Pgm 2007 National	21 2675	<u>526</u> : 1.07 491	<u>548</u> : 1.07 510	<u>523</u> : 1.08 485	<u>607</u> : 1.22 497
2006 OHSU-OIT CLS Pgm 2006 University-Based	33 1096	<u>535</u> : 1.09 490	<u>575</u> : 1.12 514	<u>500</u> : 1.03 485	<u>526</u> : 1.08 486
2006 OHSU-OIT CLS Pgm 2006 National	33 1740	<u>535</u> : 1.10 488	<u>575</u> : 1.12 512	<u>500</u> : 1.03 484	<u>526</u> : 1.07 492
2005 OHSU-OIT CLS Pgm 2005 University-based	18 799	<u>604</u> : 1.21 498	<u>666</u> : 1.30 511	<u>571</u> : 1.14 502	<u>638</u> : 1.27 501
2005 OHSU-OIT CLS Pgm 2005 National	18 1266	<u>604</u> : 1.26 481	<u>666</u> : 1.31 509	<u>571</u> : 1.16 491	<u>638</u> : 1.28 497

Appendix B, Table 1, Part B

**Graduating Class of December 2010**

**Externship**

**Section Exams**

*(Individual and Mean % Score to Nearest Whole %)*

<b>Student</b>	<b>Chemistry/ Immunology</b>	<b>Hematology</b>	<b>Microbiology</b>	<b>Transfusion Medicine</b>
<b>A</b>	92.7	86.7	94.4	93
<b>B</b>	86	87.3	94.4	80
<b>C</b>	85.3	72/85.3	91.2	83
<b>D</b>	96.7	94	99.2	93
<b>E</b>	85.3	96.7	98.4	91
<b>F</b>	91.3	91.3	92.8	90
<b>G</b>	88.	80.7	97.6	90
<b>H</b>	72.0/92.7	77.3	96.8	77
<b>I</b>	89.3	76	98.4	90
<b>J</b>	82	82.7	88.8	77
<b>K</b>	87.3	79.3	96	96
<b>L</b>	95.3	93.3	98.4	87
<b>M</b>	87.3	91.3	92	94
<b>N</b>	77.3	84.7	96.8	89
<b>O</b>	86.7	58/80.7	93.6	81
<b>P</b>	65.3/75.3	85.3	90.4	86
<b>Q</b>	96.7	91.3	98.4	96
<b>R</b>	77.3	82	96	89
<b>S</b>	82	96	97.6	86
<b>T</b>	79.3	82	95.2	73/93
<b>U</b>	72.7/80.0	78.7	88	88
<b>V</b>	93.3	99.3	96.8	97
<b>Average</b>	<b>84.7</b>	<b>84.7</b>	<b>95.1</b>	<b>87.8</b>

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 2010  
Externship Evaluation Scores for Problem Recognition (PR)  
and Problem-Solving (PS)**

Student	Hematology PR/PS	Microbiology PR/PS	Chemistry/ Immunology PR/PS	Transfusion Medicine PR/PS
A	3/3	3/3	3/3	3/3
B	3.5/3.5	2/3	3.3/3.3	4/4
C	3.5/3.5	NA/3	4/4	4/3
D	3/NA	3/3	N/A/NA	3/3
E	3/3	4/4	4/4	4/4
F	4/4	3/3	3/3	4/4
G	3.5/3.5	3.3/3.3	3.5/4	3.3/4
H	4	3.3/NA	3/4	3
I	3/2	4/4	3/3	3.5/3.5
J	3/3	3/3	3/-	3/3
K	3/3	3/3	3/3	3/3
L	4/4	3.3/4	3/2	3/3
M	4/4	3/3	3/3	3/3
N	3/3.5	4/4	3/3	3/NA
O	2/2	4/4	NA/4	4/4
P	3/3	4/4	3.5/4	4/4
Q	4/4	3/NA	3/NA	4/4
R	4/4	N/A/3	4/4	3/3
S	4/4	4/4	4/4	4/4
T	4/4	4/-	3/3	4/4
U	4/4	3/3	4/4	4/4
V	4/4	NA/NA	3/3	3/3
<b>Average</b>	<b>3.5/3.4</b>	<b>3.3/3.3</b>	<b>3.3/3.3</b>	<b>3.5/3.4</b>

**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:

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



**Graduating Class of December 2010  
Externship Evaluation Scores for Professional  
Attributes (PA)/Personal Responsibility(PR)**

<b>Student</b>	<b>Hematology PA/PR</b>	<b>Microbiology PA/PR</b>	<b>Chemistry/ Immunology PA/PR</b>	<b>Transfusion Medicine PA/PR</b>
<b>A</b>	4/4	4/4	4/4	4/4
<b>B</b>	3.5/3.5	4/4	4/4	4/4
<b>C</b>	3.5/3.5	3/4	4/4	4/3
<b>D</b>	3/3	4/4	3/3	4/4
<b>E</b>	4/4	4/3.5	4/4	4/4
<b>F</b>	4/4	4/4	4/4	4/4
<b>G</b>	4/4	4/3.5	4/4	3.3/3.25
<b>H</b>	4/4	4/4	4/4	4/4
<b>I</b>	3/4	3/4	4/4	3.5/4
<b>J</b>	2/3	3/4	4/4	4/4
<b>K</b>	4/4	3/3	4/4	4/4
<b>L</b>	4/4	3/4	3/3	4/3
<b>M</b>	4/4	3/4	4/4	4/4
<b>N</b>	4/4	4/4	4/4	4/3
<b>O</b>	4/4	4/4	4/4	4/4
<b>P</b>	4/4	4/4	4/4	4/4
<b>Q</b>	4/4	4/4	4/4	4/4
<b>R</b>	4/4	4/4	4/4	3/3
<b>S</b>	4/3	4/4	4/4	4/4
<b>T</b>	4/4	4/4	4/3	4/4
<b>U</b>	4/4	4/4	4/4	4/4
<b>V</b>	4/4	4/4	3/3	4/3
<b>Average</b>	<b>3.7/3.8</b>	<b>3.8/3.8</b>	<b>3.9/3.8</b>	<b>3.9/3.7</b>

**Personal Responsibility:** Is prompt, dependable and complies with institutional and laboratory policies; notifies appropriate personnel when absent or late. Recognizes own limitations; seeks help if needed, accepts responsibility as delegated.

**Professional Attributes:** Demonstrates integrity and ethical behavior; works well with others; promotes pleasant work atmosphere; cooperative; volunteers; accepts constructive criticism and works to improve; follows dress code; maintains patient confidentiality; seeks new learning opportunities; demonstrates respect for patient dignity.

**Rating Scale:**

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

**Graduating Class of December 2010  
Externship Evaluation Scores for Laboratory Techniques  
(LT) and Laboratory Results (LR)**

<b>Student</b>	<b>Hematology LT/LR</b>	<b>Microbiology LT/LR</b>	<b>Chemistry/ Immunology LT/LR</b>	<b>Transfusion Medicine LT/LR</b>
<b>A</b>	3/3	3/3	3/3	3/3
<b>B</b>	3.6/3	3/2	3.5/3	4/3
<b>C</b>	3.3/4	3/3	4/4	4/3
<b>D</b>	3/3	4/4	3/3	3/3
<b>E</b>	4/4	4/4	4/4	4/3
<b>F</b>	4/4	3/3	3/3	4/4
<b>G</b>	4/4	3.5/3.5	4/4	3.5/3
<b>H</b>	4/4	4/4	4/4	4/NA
<b>I</b>	3/3	3/3	4/4	3.75/4
<b>J</b>	3/3	4/4	4/4	4/4
<b>K</b>	3/3	4/4	3/3	4/4
<b>L</b>	4/3	3.6/3.6	3/3	4/3
<b>M</b>	4/4	3/3	4/4	3/3
<b>N</b>	4/4	4/4	3/3	4/4
<b>O</b>	4/4	4/4	4/4	4/4
<b>P</b>	4/4	4/4	4/4	4/3
<b>Q</b>	4/4	4/4	4/3	4/4
<b>R</b>	4/4	4/4	4/4	3/3
<b>S</b>	4/4	4/4	4/4	4/4
<b>T</b>	4/4	4/4	3/3	4/4
<b>U</b>	4/4	4/4	4/4	4/4
<b>V</b>	4/4	NA/NA	3/3	4/NA
<b>Average</b>	<b>3.7/3.7</b>	<b>3.6/3.6</b>	<b>3.6/3.5</b>	<b>3.8/3.6</b>

**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