SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program Name (no acronyms): Medical Laboratory Science

Department: Clinical Health Sciences

Degree or Certificate Level: BS

College/School: **Doisy College of Health Sciences**

Date (Month/Year): 06/28/2023

Assessment Contact: amanda.reed@health.slu.edu

In what year was the data upon which this report is based collected? 2022-2023

In what year was the program's assessment plan most recently reviewed/updated? 2021-2022

Is this program accredited by an external program/disciplinary/specialized accrediting organization or subject to state/licensure requirements? Yes

If yes, please share how this affects the program's assessment process (e.g., number of learning outcomes assessed, mandated exams or other assessment methods, schedule or timing of assessment, etc.):

Our accrediting agency (NAACLS) does not require that these PLOs be included in our Annual, Mid-Cycle, or 10-year self-study. Rather, these PLOs would be categorized as "optional" methods used in a "documented plan for continuous and systematic assessment of the effectiveness of the program."

Note: We offer 3 post-baccalaureate certificates (Clinical Chemistry, Hematology, and Clinical Microbiology). At the time of data collection there was only 1 post-baccalaureate certificate student. With such a small number of students (n=1), the Clinical Microbiology Certificate Program was not assessed.

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please provide the complete list of the program's learning outcome statements and **bold** the SLOs assessed in this cycle.)

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

PLO #2: Students will communicate accurate laboratory information to members of the healthcare team.

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies.

PLO #4: Student will integrate knowledge of laboratory theory into practice.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail, identify the course(s) in which they were collected, and if they are from program majors/graduates and/or other students. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact 1- MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment (See Appendix 4)

This assignment was given to MLS students only. The MLS students are presented with an ethical dilemma as it pertains to the clinical laboratory. This case study evaluates that students recognize that every test is attached to a real person regardless of personal history since it deals directly with the test results of a close friend (HIPAA

violation). The students are asked to use the ethical decision-making model discussed in class to decide what is the most ethical way to address the situation.

They are asked to:
1. Identify the Problem
2. Determine what professional and personal values pertain to the problem
3. Propose two approaches to solving the problem and identify likely consequences of each in relation to those values
4. Describe how they would handle the situation.

No Madrid student artifacts were included.

Artifact 2- MLS-4800 Clinical Microbiology Practicum / Professional Development Evaluation (See Appendix 2)

This is a clinical course that takes place at hospital microbiology labs throughout the St. Louis metropolitan area. Only MLS students are evaluated.

The comprehensive score Professional Development Evaluation form was used to evaluate this PLO since the PLO states "all aspects of laboratory testing." The Clinical Preceptor evaluates the students at the end of their clinical rotation on the following:

1. Knowledge of the subject
2. Application of knowledge to practice
3. Judgement: Problem recognition and resolution
4. Bench work: skills and pace
5. Safety practices
6. Professionalism/Maturity
7. Attendance/Punctuality
8. Initiative/Motivation
9. Responsibility
10. Interpersonal/communication skills
11. Ability to work in a clinical lab environment/handle stressful situations
12. Adherence to the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics

No Madrid student artifacts were included

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies.

Artifact-1- MLS 3150 Urinalysis & Immunology Lab / Urinalysis Case Study Assignment (See Appendix 5)

The students are given a case study that contains pertinent patient history (age, symptoms, specimen type, etc.) along with urinalysis test results (See appendix 5). The students are asked to identify normal from abnormal results, and identify which disorder is the most likely cause of the results. In addition, they are asked to explain why each of the other disorders listed as options is not an appropriate choice.

Artifact-2- MLS 4611 Advanced Topics and Case Correlations / Case Study Presentations (See Appendix 6)

The students are given a case study that contains pertinent patient history (age, symptoms, specimen type, etc.) along with test results (more detailed and comprehensive results than those provided in artifact 1). The test results span all major areas of the clinical laboratory (Hematology, Urinalysis, Chemistry, Blood Bank, Microbiology, and Serology) as opposed to just Urinalysis as seen in artifact 1. Please see appendix 6 for a sample case. The students are asked to prepare a short PowerPoint presentation about the case (12-15 slides) using a rubric and questions in the case as their guide. They are required to highlight the abnormal test results and discuss the diagnosis, treatment, and prognosis in terms of these abnormal test results, as well as explain the principle of the major tests.

No Madrid student artifacts were included.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics. (See appendix 3)

Artifact-1- MLS 4350 Immunohematology Lab / Immunohematology Ethics Case Study Assignment (See Appendix 7)

The students are presented with an ethical dilemma as it pertains to the clinical laboratory. This case study deals with whether to report a coworker for releasing erroneous results and workplace violence. The students are asked to use the ethical decision-making model discussed in class to decide what is the most ethical way to address the situation. They are asked to:
1. Identify the Problem
2. Determine what professional and personal values pertain to the problem
3. Propose two approaches to solving the problem and identify likely consequences of each in relation to those values
4. Describe how they would handle the situation

No Madrid student artifacts were included.

Artifact-2- MLS 4780 Clinical Immunohematology Practicum / Professional Development Evaluation (See Appendix 2)

The Professional Development Evaluation forms contain one characteristic/behavior that have been keyed back to PLO#5. The Clinical Preceptor evaluates the students at the end of their clinical rotation on the following:

12. Adherence to the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics (PLO #5)	Identifies central ethical issues and uses them as a basis for ethical evaluation.	Formulates an implementation plan that delineates the execution of the decision.	Formulates an implementation plan that delineates the execution of the decision and that evidences a thoughtful reflection on the benefits and risks of action. Sees "big picture." Conveys understanding of how own actions have consequences and impacts patient care.
Circle:	**2**	**4**	**5**

No Madrid student artifacts were included

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact 1- MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment (n = 2)

The Program Director uses the assessment rubric located in appendix 1 to evaluate each assignment. The Program Director determines the % of students that achieved a ranking of "introduce" or higher on the assessment rubric.

Artifact 2- MLS-4800 Clinical Microbiology Practicum / Professional Development Evaluation (n= 9)
(This is a clinical course that takes place at hospital microbiology labs throughout the St. Louis metropolitan area).

The forms were completed by the Clinical Preceptors at the end of the students' clinical rotation and were then evaluated by the MLS Program Director. The Clinical Preceptor ranked the students on a scale of 2,4, or 5 (5 being the highest score) on various professional characteristics and behaviors. The MLS Program Director used the assessment rubric located in appendix 1 to review the comprehensive score. The scores of each characteristic/behavior were added together and then divided by the total number to get an average score for PLO #1. The Program Director identified students scoring 4 - 5 as achieving the ranking of "master" since, per the evaluation form, students scoring a 4 "Meets expectations. Student is currently performing as an entry level MLS to varying degrees." Students scoring a 5 are considered exceptional and the "student's performance is well above what would be expected of an entry level MLS."

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies

Artifact-1- MLS 3150 Urinalysis & Immunology Lab / Urinalysis Case Study Assignment (n = 14)

The urinalysis case study assignment was reviewed by the MLS Program Director. The Program Director used the assessment rubric located in appendix 1 to evaluate each assignment. The results were tallied, and the Program Director determined the % of students that achieved a ranking of "introduce" or higher on the assessment rubric.

Artifact-2- MLS 4611 Advanced Topics and Case Correlations / Case Study Presentations (n = 8)

The Program Director attended the case study presentations and evaluated the students using the assessment rubric located in appendix 1. The results were tallied, and the Program Director determined the % of students that achieved a ranking of "mastery" or higher on the assessment rubric.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics. (See appendix 2)

Artifact-1- MLS 4350 Immunohematology Lab / Immunohematology Ethics Case Study Assignment (n = 2)

The Program Director uses the assessment rubric located in appendix 1 to evaluate each assignment. The Program Director determined the % of students that achieved a ranking of "introduce" or higher on the assessment rubric.

Artifact-2- MLS 4780 Clinical Immunohematology Practicum / Professional Development Evaluation (n = 8)
(This is a clinical course that takes place at hospital microbiology labs throughout the St. Louis metropolitan area).

The forms were completed by the Clinical Preceptors at the end of the students' clinical rotation and were then evaluated by the MLS Program Director. The Clinical Preceptor ranked the students on a scale of 2,4, or 5 (5 being the highest score) on various professional characteristics and behaviors. The MLS Program Director used the assessment rubric located in appendix 1 to review the comprehensive score. The scores of each characteristic/behavior were added together and then divided by the total number to get an average score for PLO #1. The Program Director identified students scoring 4 - 5 as achieving the ranking of "master" since, per the evaluation form, students scoring a 4 "Meets expectations. Student is currently performing as an entry level MLS to varying degrees." Students scoring a 5 are considered exceptional and the "student's performance is well above what would be expected of an entry level MLS."

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact 1- MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment (n = 2)

100% of the students (2/2) achieved a ranking of "introduce" or higher meaning they were not performing as an entry level MLS. 50% (1/2) earned a ranking of "introduce" and 50% earned a ranking of "reinforce" meaning they are "currently performing as an entry level MLS to varying degrees.

Teaching modality did not differ for this artifact. All students were members of a face-to-face class.

Artifact 2- MLS-4800 Clinical Microbiology Practicum / Professional Development Evaluation (n= 9)

89% (8/9) of the students achieved a ranking of "mastery." 11% of the students achieved a ranking of "reinforce."

Teaching modality did not differ for this artifact. All students were assessed at off campus locations as part of their clinical practicums.

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies

Artifact-1- MLS 3150 Urinalysis & Immunology Lab / Urinalysis Case Study Assignment (n = 14)

100% (14/14) of the students achieved a ranking of "introduce" meaning they were able to recognize normal from abnormal results. 7% (1/14) achieved a ranking of introduce only. 21% (3/14) of the students achieved a ranking of "reinforce" meaning they could also choose appropriate next steps in each case." 71% (10/14) of the students were also able to "propose solutions to laboratory-based case study problems with justification."

Teaching modality did not differ for this artifact. All students were members of a face-to-face class.

Artifact-2- MLS 4611 Advanced Topics and Case Correlations / Case Study Presentations (n = 8)

The goal of an average of 85% of students will achieve a ranking of *"mastery"* was not achieved. Only **75% (6/8)** of the students achieved the ranking of "mastery" and could "propose solutions to case study problems with justification." 25% (2/8) achieved a ranking of "reinforce." This means they were able to "choose the appropriate next step in each case" but were not able to "propose solutions to case study problems."

Teaching modality did not differ for this artifact. All students were members of a face-to-face class.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics. (See appendix 2)

Artifact-1- MLS 4350 Immunohematology Lab / Immunohematology Ethics Case Study Assignment (n = 2)

100% (2/2) of the students achieved a ranking of "introduce" meaning they were able to identify central ethical issues and use them as a basis for ethical evaluation. 100% (2/2) of the students also achieved a ranking of "mastery" meaning that in addition to identifying the central issues, they were also able to "formulate an implementation plan that delineates the execution of the decision" as well as give a "thoughtful reflection on the benefits and risks of action."

Teaching modality did not differ for this artifact. All students were members of a face-to-face class.

Artifact-2- MLS 4780 Clinical Immunohematology Practicum / Professional Development Evaluation (n = 8)

The goal of an average of 85% of students will achieve a ranking of *"mastery"* was not achieved. **Only 62.5% (5/8)** of the students achieved a ranking of "mastery" and could "formulate an implementation plan that delineates the execution of the decision" as well as give a "thoughtful reflection on the benefits and risks of action." 37.5% (3/8) of the students achieved a ranking of "reinforce."

Teaching modality did not differ for this artifact. All students were assessed at off campus locations as part of their clinical practicums.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you? Address both a) learning gaps and possible curricular or pedagogical remedies, and b) strengths of curriculum and pedagogy.

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact 1- MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment (n = 2)

100% of the students achieved a ranking "introduce" or higher. This is the first year that this artifact was assessed. The artifact was not assessed in the 2020-2021 cycle due to COVID.

While the students performed well on this evaluation, the MLS faculty have decided that the ethics case assignment is not the best artifact that we can use. We also decided that it would be best to assess freshmen in the program as opposed to juniors. We added an ignite course to our curriculum and believe that the ethics, mission, and professionalism reflection paper that is assigned in the course will be a better tool to measure this PLO. The new artifact will also be better reflected in the associated rubric.

Artifact 2- MLS-4800 Clinical Microbiology Practicum / Professional Development Evaluation (n= 9)

89% (8/9) of the students achieved a ranking of "mastery." This was the first year that we used the comprehensive score from the professional development evaluation form as the artifact #2 instead of only using certain characteristics/behaviors to evaluate PLO #1. We decided that a more holistic approach to evaluation is needed since the PLO states "all aspects of laboratory testing." This decision was made after discussing each characteristic/behavior that is listed on the form which includes:

1. Knowledge of the subject
2. Application of knowledge to practice
3. Judgement: Problem recognition and resolution
4. Bench work: skills and pace
5. Safety practices
6. Professionalism/Maturity
7. Attendance/Punctuality
8. Initiative/Motivation
9. Responsibility
10. Interpersonal/communication skills
11. Ability to work in a clinical lab environment/handle stressful situations
12. Adherence to the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics

Since we only have 1 year of data for this artifact, additional assessment cycles are needed to determine whether changes remain useful over time or if additional modifications are needed.

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies

Artifact-1- MLS 3150 Urinalysis & Immunology Lab / Urinalysis Case Study Assignment (n = 14)

100% (14/14) of the students achieved a ranking of "introduce" meaning they were able to recognize normal from abnormal results.

We have met he benchmark for 3 assessment cycles and upon review of the Urinalysis exercise, the current approach that is used to introduce clinical laboratory theory in lecture followed by videos instructing students on how to perform testing, and the hands-on student laboratory activity are successful teaching methodologies.

However, the MLS faculty feel that the rubric needs to be revised to better measure both artifacts. It was not as useful for measuring artifact 2. See explanation below.

Artifact-2- MLS 4611 Advanced Topics and Case Correlations / Case Study Presentations (n = 8)

Only 75% of the students achieved "mastery." This is the 2nd year in a row that we did not meet the 85% mastery benchmark. The MLS faculty do not believe that the rubric effectively evaluates the case study assignment. The PLO rubric did not reflect what was asked of the students.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics. (See appendix 2)

Artifact-1- MLS 4350 Immunohematology Lab / Immunohematology Ethics Case Study Assignment (n = 2)

This artifact was updated from the artifact assessed during the AY2018-2019. Since it was also not assessed during the AY2020-2021, we assessed it for the first time in AY2022-2023. 100% (2/2) of the students achieved a ranking of "introduce." Since we only have 1 year of data for this artifact, additional assessment cycles are needed to determine whether changes remain useful over time or if additional modifications are needed. The MLS faculty also decided that it would be best to assess freshmen in the program as opposed to juniors.

Artifact-2- MLS 4780 Clinical Immunohematology Practicum / Professional Development Evaluation (n = 8)

The goal of an average of 85% of students will achieve a ranking of *"mastery"* was not achieved. Only **62.5% (5/8)** of the students achieved the ranking of "mastery." This is a significant drop from the previous 2 assessment cycles, each of which were at 100% mastery. The MLS faculty believe that this the rubric does not accurately measure this artifact. For example, the scoring instructions on the Professional Development Evaluation state that a score of 4 "meets" expectations and a score of 5 "exceeds" expectations of an entry level MLS (see appendix 2). A score of 4 meets expectations according to the Professional Development Evaluation form but equates to "reinforce" on the PLO rubric (see appendix 1). We believe that the preceptors scored the students as 4's because the students are not entry level MLS and, therefore, meet the expectations.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss the results and findings from this cycle of assessment?

These results were shared and discussed at the fall 2023 MLS program meeting.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies	• Course content • Teaching techniques • Improvements in technology • Prerequisites	• Course sequence • New courses • Deletion of courses • Changes in frequency or scheduling of course offerings
Changes to the Assessment Plan	• Student learning outcomes • Artifacts of student learning • Evaluation process	• Evaluation tools (e.g., rubrics) • Data collection methods • Frequency of data collection

Please describe the actions you are taking as a result of these findings.

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact-1- MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment

While the students performed well on this evaluation, the MLS faculty have decided that the ethics case assignment is not the best artifact that we can use. We also decided that it would be best to assess freshmen in the program as opposed to juniors.

We added an ignite course to our curriculum and believe that the ethics, mission, and professionalism reflection paper that is assigned in the course will be a better tool to measure this PLO. The rubric will also be revised to better evaluate this new assignment.

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies.

Artifact-1- MLS 3510 urinalysis & immunology lab / Urinalysis case study assignment

We have met he benchmark for 3 assessment cycles and upon review of the Urinalysis exercise, the current approach that is used to introduce clinical laboratory theory in lecture followed by videos instructing students on how to perform testing, and the hands-on student laboratory activity are successful teaching methodologies. However, this exercise is being moved back to BLS 1150 Foundations of Medical Laboratory Science Lab.

PLO #3: Students will apply critical reasoning to solve laboratory-based case studies.

Artifact-2- MLS 4611 Advanced topics and Case Correlations / Observations of case study presentations

This is the 2nd year in a row that we did not meet the 85% mastery benchmark. The MLS faculty do not believe that the rubric effectively evaluates the case study assignment. The PLO rubric did not reflect what was asked of the students.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS)

Artifact-1- MLS 4350 immunohematology lab / Immunohematology ethics case study assignment

Since it was also not assessed during the AY2020-2021, we assessed it for the first time in AY2022-2023. 100% (2/2) of the students achieved a ranking of “introduce.” Since we only have 1 year of data for this artifact, additional assessment cycles are needed to determine whether changes remain useful over time or if additional modifications are needed. The MLS faculty also decided that it would be best to assess freshmen in the program as opposed to juniors. Therefore this artifact will be moved to BLS 1000 Foundations of Medical Laboratory Science Immunohematology Case study Assignment.

PLO #5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS)

Artifact-2- MLS 4870 Clinical Immunohematology / Practicum Professional Development Evaluation

The goal of an average of 85% of students will achieve a ranking of "mastery" was not achieved. Only 62.5% (5/8) of the students achieved the ranking of "mastery." This is a significant drop from the previous 2 assessment cycles, each of which were at 100% mastery. The MLS faculty believe that this the rubric does not accurately measure this artifact. For example, the scoring instructions on the Professional Development Evaluation state that a score of 4 "meets" expectations and a score of 5 "exceeds" expectations of an entry level MLS (see appendix 2). A score of 4 meets expectations according to the Professional Development Evaluation form but equates to "reinforce" on the PLO rubric (see appendix 1). We believe that the preceptors scored the students as 4's because the students are not entry level MLS and, therefore, meet the expectations.

Due to the clinical preceptors' inconsistencies in completing the evaluation forms, the MLS faculty chose to change the artifact to an ethical reflection exercise in the new CORE 3500 course that is being built. This will take place during their clinical rotations spring of their senior year.

If no changes are being made, please explain why.

PLO #1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Artifact-2- MLS-4800 Clinical Microbiology Practicum / Professional Development Evaluation

This was the first year that we used the comprehensive score from the professional development evaluation form as the artifact #2 instead of only using certain characteristics/behaviors to evaluate PLO #1. We decided that a more holistic approach to evaluation is needed since the PLO states "all aspects of laboratory testing." Since we only have 1 year of data for this artifact, additional assessment cycles are needed to determine whether changes remain useful over time or if additional modifications are needed.

MLS Curriculum & Pedagogies

The MLS faculty propose that no changes be made to the curriculum or pedagogies at this time for 2 reasons.

i. The MLS curriculum was recently updated (implemented with the 2024 cohort).
ii. Want at least 3 consecutive assessment periods where static artifacts are used to accurately evaluate each PLO.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years **as a result of previous assessment data**?

NA. We have not yet had enough consistent evaluation methods or continuous assessment cycles to make any meaningful determinations from the assessment data.

B. How has the change/have these changes identified in 7A been assessed?

We are editing and revising or replacing assessment rubrics and/or artifacts to better measure our PLOs.

C. What were the findings of the assessment?

We are unable to make meaningful determinations based upon the information collected thus far.

D. How do you plan to (continue to) use this information moving forward?

We will continue revising rubrics and artifacts until we get 3 years of consecutive data that will then be used to make changes if warranted.

IMPORTANT: Please submit any assessment tools (e.g., artifact prompts, rubrics) with this report as separate attachments or copied and pasted/appended into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document. Thank you.

Appendices

Appendix 1: Assessment Rubrics Used to Evaluate PLO #1, 3, and 5

MEDICAL LABORATORY SCIENCE (MLS)		
Program Learning Outcome (PLO #1): Students will demonstrate respect for human life with regard to all aspects of laboratory testing.		
Introduce**	**Reinforce****	**Master****
• Student is not performing as would be expected of an entry level MLS.	• Student is currently performing as an entry level MLS to varying degrees.	• Student's performance is well above what would be expected of an entry level MLS.

****IMPORTANT NOTES:** The ratings, identified by the column headings, are of increasing complexity moving across the table (from left to right). Students who meet the "reinforce" criteria must be able to first meet the "introduce" criteria. Likewise, students who meet the "master" criteria must also meet the "introduce" and "reinforce" criteria.

MEDICAL LABORATORY SCIENCE (MLS)		
Program Learning Outcome (PLO #3): Students will apply critical reasoning to solve laboratory-based case studies.		
Introduce**	**Reinforce****	**Master****
• Recognizes normal from abnormal results.	• Chooses appropriate next steps in each case.	• Proposes solutions to laboratory-based case study problems with justification.

****IMPORTANT NOTES:** The ratings, identified by the column headings, are of increasing complexity moving across the table (from left to right). Students who meet the "reinforce" criteria must be able to first meet the "introduce" criteria. Likewise, students who meet the "master" criteria must also meet the "introduce" and "reinforce" criteria.

MEDICAL LABORATORY SCIENCE (MLS)		
Program Learning Outcome (PLO #5): Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics		
Introduce**	**Reinforce****	**Master****
		• Formulates an implementation plan that delineates the execution of the decision and that evidences

MEDICAL LABORATORY SCIENCE (MLS)		
Program Learning Outcome (PLO #5): Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics		
Introduce**	**Reinforce****	**Master****
• Identifies central ethical issues and uses them as a basis for ethical evaluation.	• Formulates an implementation plan that delineates the execution of the decision	a thoughtful reflection on the benefits and risks of action.

****IMPORTANT NOTES:** The ratings, identified by the column headings, are of increasing complexity moving across the table (from left to right). Students who meet the "reinforce" criteria must be able to first meet the "introduce" criteria. Likewise, students who meet the "master" criteria must also meet the "introduce" and "reinforce" criteria.

Appendix 2: MLS Professional Development Evaluation Form

SECTION II: PROFESSIONAL DEVELOPMENT EVALUATION

INSTRUCTIONS TO THE EVALUATOR:

Rate the student in each area by circling:

2 = Needs improvement. / Student is not performing as would be expected of an entry level MLS.

4 = Meets expectations. / Student is currently performing as an entry level MLS to varying degrees.

5 = Exceptional. / Student's performance is well above what would be expected of an entry level MLS.

- ➔ Comments can be made as needed at the end of this section. Please be specific in illustrating why rating is assigned especially if scoring as "needs improvement".
- ➔ Ratings of 2 may require remedial work by the student at the instructor's discretion and will require a meeting with the program coordinator

Minimum grade of 80% in Professional Development is required to successfully complete the rotation.

COGNITIVE/ACADEMIC PERFORMANCE:

1. Knowledge of the subject	Can relate minimal information outlined in the learning objectives.	Demonstrates good theoretical knowledge of the material covered. Can verbally relate the information outlined in the learning objectives.	Demonstrates unusual depth of understanding with productive discussion and probing questions. Grasps theoretical concepts usually understood after >1 year experience.
Circle:	**2**	**4**	**5**

2. Application of knowledge to practice	Has difficulty translating knowledge to practice. Unable to proceed once directions are given.	Applies knowledge to bench work. Demonstrates ability to proceed based on initial findings, i.e. can perform procedure without prompting. Demonstrates appropriate decision making and problem solving skills for entry level MLS.	Can extrapolate knowledge and apply to low volume or seldom seen specimens or situations.
Circle:	**2**	**4**	**5**

3. Judgment: Problem recognition and resolution (PLO #2, #4)	Has difficulty distinguishing normal from abnormal situations. Doesn't recognize or proceed appropriately in problem situations, i.e. problem specimen or QC out of range.	Recognizes normal from abnormal. Recognizes problem specimens with ease. Proceeds appropriately in each case. Recognizes situations that require consultation with instructor and asks appropriate questions.	Exceptional at problem identification and solving. Instructor would feel comfortable having student perform their own family member's lab samples with no worry.
Circle:	**2**	**4**	**5**

PSYCHOMOTOR/BENCH PERFORMANCE:

4. Bench Work: Skills and pace	Everyday bench skills need improvement. Hasn't developed work pace that would meet expected turn-around-times. OR Sacrifices accuracy for speed: makes mistakes, misses things by going too fast.	Does good work at the bench. Has good manual dexterity. Demonstrates efficiency/balances speed and accuracy. Can maintain appropriate work pace while producing accurate results.	Demonstrates excellent multitasking skills usually seen in experienced techs.
Circle:	**2**	**4**	**5**

5. Safety Practices	Does not carry out safety practices at all times, student disregarded or had inconsistent adherence to safety rules.	Observes safety practices including wearing lab coat/gloves the majority of the time with only occasional lapses; has no food in the lab; proper disposal of waste in appropriate bins.	Observes safety practices a all times with no prompting to include wearing lab coat/gloves, no food in the lab, and appropriate disposal of waste.
Circle:	**2**	**4**	**5**

AFFECTIVE/TEAM PERFORMANCE:

6. Professionalism/ Maturity (PD 2, 5, 11) (PLO #4)	Does not follow policies set forth by clinical site. Complains about policies and expectations.	Follows all policies at all times without complaint. Focused. Engaged in learning activities and lab environment. Is a good representative of the laboratory profession.	Unsolicited positive feedback received from non-instructors or people outside section, i.e. student's professional behavior is above and beyond.
Circle:	**2**	**4**	**5**

7. Attendance/Punctuality (PD 1)	Arrives late/leaves early. Takes extended time for breaks or lunch. Has unexcused absences. Present in area during unscheduled times or not in the area during scheduled times.	Arrives in area and is ready to start at scheduled time the majority of the rotation. Remains in area until instructor indicates work is done. Takes breaks and lunch when instructor indicates and mostly comes back on time.	Consistent attendance with no unexcused absences, arrives early or on time for shift. Breaks and lunch are taken when instructed and are for appropriate length of time. Communicates and works with instructor for upcoming conflicts in schedule.
Circle:	**2**	**4**	**5**

8. Initiative/Motivation (PD 6, 12, 13)	Seems unprepared for the day. Gives impression of being uninterested. Indicates would like to leave early, rather than study or complete additional tasks in section. Satisfied with "getting by" rather than learning material or skill.	Arrives prepared. Has looked ahead and studied what will be covered that day. Asks for additional activities when assigned activities are complete. Concerned with learning info/skills needed to work as an MLS not just to achieve a good grade. Uses section texts, references, resources to supplement learning.	Proceeds on own, i.e. starts a bench, starts setting up area, performs QC or daily maintenance without being prompted, when appropriate. Helped with department or section project in addition to student assignments.
Circle:	**2**	**4**	**5**

9. Responsibility (PD 7, 8)	Does not accept responsibility for own work. Can't accept being wrong. Offers excuses or deflects blame to others.	Accepts responsibility for own work; acknowledges errors and learns from them. Accepts constructive criticism of skills or behavior.	Accepts responsibility for own work and always seeks feedback to improve performance. Accepts constructive criticism of skills or behavior and uses in positive manner for improvement.
Circle:	**2**	**4**	**5**

10. Interpersonal/ Communication Skills (PD 9) (PLO #2)	Unable to clearly convey ideas verbally or in writing. Dismissive or patronizing towards lab staff. Questions staff credentials. Communicates in confrontational manner. Brings cold or negative atmosphere to the section.	Effectively conveys and receives ideas; responds appropriately. Is respectful of instructors and other lab staff. Appreciates instructors' knowledge, skills, and experience. Interactive. Communicates in a positive and timely manner with instructors and lab staff. Contributes to a positive work environment.	Unsolicited positive feedback received from non-instructors or people outside section, i.e. students communication skills with staff, visitors, patients is exceptional; offers diplomatic comments in difficult conversations.
Circle:	**2**	**4**	**5**

11. Ability to work in clinical lab environment/handle stressful situations (PD 3, 4)	Seems tired frequently. Frustrates easily. Has difficulty coping with work volume, people, environment. Has difficulty adjusting to variations or changes.	Alert, interactive. "Goes with the flow." Performs well in a busy lab environment. Deals well with variety of personalities. Demonstrates patience with instructors and staff, procedural processes or wait times. Demonstrates flexibility and ability to adapt to change.	Demonstrated calmness, flexibility in unusual situations, i.e. very high work volume, instrument or computer downtime.
Circle:	**2**	**4**	**5**

12. Adherence to the American Society for Clinical Laboratory Science (ASCLS) Professional Code of Ethics (PLO #5)	Identifies central ethical issues and uses them as a basis for ethical evaluation.	Formulates an implementation plan that delineates the execution of the decision.	Formulates an implementation plan that delineates the execution of the decision and that evidences a thoughtful reflection on the benefits and risks of action. Sees "big picture." Conveys understanding of how own actions have consequences and impacts patient care.
Circle:	**2**	**4**	**5**

Appendix 3: ASCLS Code of Ethics

Preamble

The Code of Ethics of the American Society for Clinical Laboratory Science sets forth the principles and standards by which Medical Laboratory Professionals and students admitted to professional education programs practice their profession.

I. Duty to the Patient

Medical Laboratory Professionals' primary duty is to the patient, placing the welfare of the patient above their own needs and desires and ensuring that each patient receives the highest quality of care according to current standards of practice. High quality laboratory services are safe, effective, efficient, timely, equitable, and patient-centered. Medical Laboratory Professionals work with all patients and all patient samples without regard to disease state, ethnicity, race, religion, or sexual orientation. Medical Laboratory Professionals prevent and avoid conflicts of interest that undermine the best

interests of patients.

Medical Laboratory Professionals are accountable for the quality and integrity of the laboratory services they provide. This obligation includes maintaining the highest level of individual competence as patient needs change, yet practicing within the limits of their level of practice. Medical Laboratory Professionals exercise sound judgment in all aspects of laboratory services they provide. Furthermore, Medical Laboratory Professionals safeguard patients from others' incompetent or illegal practice through identification and appropriate reporting of instances where the integrity and high quality of laboratory services have been breached.

Medical Laboratory Professionals maintain strict confidentiality of patient information and test results. They safeguard the dignity and privacy of patients and provide accurate information to patients and other health care professionals. Medical Laboratory Professionals respect patients' rights to make decisions regarding their own medical care.

II. Duty to Colleagues and the Profession

Medical Laboratory Professionals uphold the dignity and respect of the profession and maintain a reputation of honesty, integrity, competence, and reliability. Medical Laboratory Professionals contribute to the advancement of the profession by improving and disseminating the body of knowledge, adopting scientific advances that benefit the patient, maintaining high standards of practice and education, and seeking fair socioeconomic working conditions for members of the profession.

Medical Laboratory Professionals accept the responsibility to establish the qualifications for entry to the profession, to implement those qualifications through participation in licensing and certification programs, to uphold those qualifications in hiring practices, and to recruit and educate students in accredited programs to achieve those qualifications.

Medical Laboratory Professionals establish cooperative, honest, and respectful working relationships within the clinical laboratory and with all members of the healthcare team with the primary objective of ensuring a high standard of care for the patients they serve.

III. Duty to Society

As practitioners of an autonomous profession, Medical Laboratory Professionals have the responsibility to contribute from their sphere of professional competence to the general well-being of society. Medical Laboratory Professionals serve as patient advocates. They apply their expertise to improve patient healthcare outcomes by eliminating barriers to access to laboratory services and promoting equitable distribution of healthcare resources.

Medical Laboratory Professionals comply with relevant laws and regulations pertaining to the practice of Clinical Laboratory Science and actively seek, to change those laws and regulations that do not meet the high standards of care and practice.

Pledge to the Profession

As a Medical Laboratory Professional, I pledge to uphold my duty to Patients, the Profession and Society by:

- Placing patients' welfare above my own needs and desires.
- Ensuring that each patient receives care that is safe, effective, efficient, timely, equitable and patient-centered.
- Maintaining the dignity and respect for my profession.
- Promoting the advancement of my profession.
- Ensuring collegial relationships within the clinical laboratory and with other patient care providers.
- Improving access to laboratory services.
- Promoting equitable distribution of healthcare resources.
- Complying with laws and regulations and protecting patients from others' incompetent or illegal practice
- Changing conditions where necessary to advance the best interests of patients.

Appendix 4: Microbiology Ethics Case Study Assignment

MLS 4520 Medical Bacteriology Ethics Case Study Assignment- Clinical Microbiology

You are working on the genital cultures bench and have identified *Neisseria gonorrhoeae* as the patient's infectious agent. As you are entering the results in the computer, you notice the patient is your best friend's spouse. Your friend knows that you work in the Clinical Microbiology Laboratory where the culture was performed and asks whether you have seen the results.

HIPPA regulations (see note below) forbid the release of patient information except as defined in the policy which excludes telling anyone including the patient without permission from the patient's physician or primary health care provider.

Note: In 1996, United States Congress enacted the Health Insurance Portability and Accountability Act, known as HIPAA. HIPAA is a federal mandate overseen by the U.S. Department of Health and Human Services and governs the use and disclosure of individually identifiable health information. This rule is commonly referred to as the HIPAA privacy regulation.

Ethical Dilemma: Use the model discussed in class to complete the following:

1. Describe the dilemma.
2. Determine what personal and professional values pertain to the problem.
3. Propose two approaches to solving the problem and identify the likely consequences of each in relation to those values.
4. How would you handle this situation and why?

Appendix 5: Urinalysis Case Study Assignment

Name: _____ **Major: _____**

CASE STUDY:
A fresh, first morning urine sample was obtained from a 27-year-old female complaining of frequency and painful urination. A urinalysis revealed the following:

Physical/Chemical	
Color:	yellow
Clarity:	turbid
Specific gravity:	1.024
pH:	7.5
Protein:	trace
Glucose:	negative
Ketone:	negative
Bilirubin:	negative
Blood:	trace
Nitrite:	positive
Leukocyte esterase:	positive
Urobilinogen:	1 Ehrlich unit

Microscopic	
RBC/hpf:	3-5
WBC/hpf:	25-30
Other:	many bacteria

12. Circle the abnormal result(s). (2 points)

13. Listed below are three disorders. Choose the disorder which is the most likely cause for the results obtained. JUSTIFY your choice and EXPLAIN WHY each of the other disorders is not an appropriate choice. (4 points)

    a. Urinary tract infection (UTI)
    b. Kidney stone
    c. Diabetic ketoacidosis

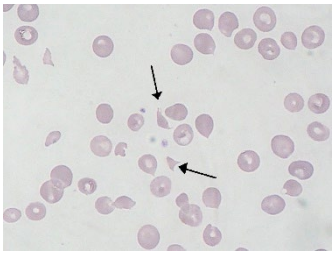
14. What additional lab testing should be performed to confirm your diagnosis? (2 points)

Appendix 6: Advanced Topics Sample Case Study

A 58-year-old male patient presents with complaints of vomiting, loose stools and crampy abdominal pain over the last 3 days. He has had several BM per day and has noted mucus in the stools, at times tinged with blood. He has had a subjective (feel, not measured) fever and chills over the last day. No one else is sick at home. He has not traveled recently and had no previous change in diet.

- Past Medical History: DM II
- Vital signs on admission:
  - Temperature 101F
  - Pulse rate 110/min & Blood pressure 98/60 mm Hg supine
  - Pulse rate 125/min & Blood pressure 85/65 mm Hg upright

- Laboratory tests:
  - Hematology
    - Hemoglobin 10.6 g/dL
    - Hematocrit 31%
    - Platelet count 19,000/uL
    - WBC 14,300/ uL
    - ESR: 62 (0-20mm/hr)



  - Chemistry:
    - Na 132 meq/L (136-148 meq/L)
    - K 6.7 meq/L (3.5-5.0 meq/L)
    - Cl 103 meq/L
    - HCO3 18 meq/L
    - Glucose 331mg/dL (60-99 mg/dL)
    - Albumin 4.0 g/dL (3.5-5g/dL)
    - Urea 97 mg/dL (8-35mg/dl)
    - Creatinine 3.1 mg/dL (0.6-1.6 mg/dL)
    - LDH 480 U/L (140-280 U/L) h

- Total BR 10.5 mg/dL (0.3 to 1.9 mg/dL)
- Indirect BR 9.3 mg/dL (0.2 to 0.7 mg/dL)
- Serum haptoglobin 5 mg/dL (30-200 mg/dL)
- No hepatitis A

- Urinalysis:
  - Specific gravity 1.020
  - pH 6.0
  - Blood 2(+)
  - Protein 3(+)
  - Glucose 3(+)
  - Ketone 1(+)
  - Bilirubin (-)
  - WBC 2-4/HPF
  - RBC 14-16/HPF

- Blood Bank: direct Coombs negative
- Microbiology: both blood and stool cultures positive for E. coli H7:0157

Questions:

1. What disease explains the symptoms and lab results?
2. What is the pathophysiology of this disease?
3. What are the principles behind the diagnostic lab tests, and how are the abnormal lab results related to the pathophysiology of the disease?
4. What is the treatment and prognosis for this condition?

Appendix 7: Immunohematology Ethics Case Study Assignment

Ethics Case 2 - Immunohematology (Blood Bank)

Herbie is the dayshift (7:00 am-3:30 pm) Medical Laboratory Scientist (MLS) in the Immunohematology (Blood Bank) Laboratory at Agglutination Medical Center. Suppose that you are the evening shift MLS who works from 3:00-11:30 pm. Prior to your arrival on this day, Herbie performed a STAT blood typing test on a patient. At the time the test was ordered, the surgery team alerted Herbie that the patient will likely need two units of blood soon. The following results were obtained.

Patient Cells +			**Patient Serum +**	
Anti-A reagent	Anti-B reagent	Anti-A,B reagent	a cells commercial reagent	b cells commercial reagent
negative	negative	negative	positive	positive

After contemplating the results obtained above for a few moments, Herbie recorded the following interpretation of these results as: ABO Type AB Blood. Moments later, a member of the surgery team called Herbie & requested two (2) units of blood for the patient.

Confident of his test interpretation and without any further testing, Herbie enters and releases the results. Standard protocol in the blood bank lab is for a member of each shift to check the test interpretation and result entries of all work performed on the previous shift.

You are the designee on this particular day. Upon inspection of Herbie's paperwork trail, you detect the error in

interpretation of the test results. You debate reporting this to the BB supervisor & the lab manager because Herbie has been in trouble for similar issues before. The last time, he was told that he would only get one more chance before being fired. You "ratted" on him last time at which point Herbie threatened you and your family. Frankly, you are scared of him. What action should you take?

Ethical Dilemma: Use the model discussed in class to complete the following:

1. Describe the dilemma.

2. Determine what personal and professional values pertain to the problem.

3. Propose two approaches to solving the problem and identify the likely consequences of each in relation to those values.

4. How would you handle this situation and why?

Program Assessment Data Collection Tool

HIM

~~PLO 1.1 and 1.2~~

Program Learning Outcome 1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Assessment Mapping/Tools: 1. MLS 4520 Medical Bacteriology / Microbiology Ethics Case Study Assignment

Program Target: An average of 85% of students will achieve a ranking of "introduce" or higher using corresponding assessment rubric.

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric.
Responsible Person: MLS Program Director.
Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an odd number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target										
AY 18/19	8	8	100%	Immunohematology Ethics assignment								
AY 20/21	NA	NA	NA	Assignment changed to microbiology ethics assignment but not given due to COVID								
AY 22/23	2	2	100%	Change artifact to BLS 1000 Ethics, Mission, & Professionalism reflecion paper								

Program Learning Outcome 1: Students will demonstrate respect for human life with regard to all aspects of laboratory testing.

Assessment Mapping/Tools: 2. MLS 4800 Clinical Microbiology Practicum Professional Development Evaluation

Program Target: An average of 85% of students will achieve a ranking of "mastery" using corresponding rubric

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric.
Responsible Person: MLS Program Director.
Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an odd number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target										
AY 18/19	7	5	71.43%	Clinical Immunohematology Evaluation								
AY 20/21	6	6	100%	Clinical Microbiology Evaluation				Updated form use comprehensive score for 2022-2023 cycle				
AY 22/23	9	8	89%	Update rubric								

Program Assessment Data Collection Tool

HIM

~~PLO 3.1 and 3.2~~

Program Learning Outcome 3: Students will apply critical reasoning to solve laboratory-based case studies.

Assessment Mapping/Tools: 1. MLS 3150 Urinalysis & Immunology Lab / Urinalysis case study assignment

Program Target: An average of 85% of students will achieve a ranking of "introduce" or higher using corresponding assessment rubric

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric.
Responsible Person: MLS Program Director.
Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an **odd** number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target										
AY 18/19	8	8.00	100.00%									
AY 20/21	9	8	88.89%	Assignment moved to MLS 3150 Urinalysis & Immunology Lab								
AY 22/23	14	14	100%	Assignment moved to BLS 1150 Foundations of MLS & rubric updated								

Program Learning Outcome 3: Students will apply critical reasoning to solve laboratory-based case studies.

Assessment Mapping/Tools: 2. MLS 4611 Advanced topics and Case Correlations / Observations of case study presentations

Program Target: An average of 85% of students will achieve a ranking of "mastery" using corresponding rubric

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric.
Responsible Person: MLS Program Director Analysis
Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an **odd** number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target										
AY 18/19	9	9	100.00%									
AY 20/21	4	2	50%									
AY 22/23	8	6	75%	Assignment moved to Core 3500 or someplace & rubric updated								

Program Assessment Data Collection Tool
HIM
PLO 5.1 and 5.2

Program Learning Outcome 5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS)

Assessment Mapping/Tools: 1. MLS 4350 Immunohematology Lab / Immunohematology ethics case study assignment

Program Target: An average of 85% of students will achieve a ranking of "introduce" or higher using corresponding assessment rubric.

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric. Responsible person: MLS Program Director. Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an odd number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target											
AY 18/19	8	8	100.00%	Assignment was changed to Immunohematology Ethics Assignment									
AY 20/21	NA	NA	NA	Assignmnent moved to MLS 4350 Immunohematology Lab & not given due to COVID									
AY 22/23	2	2	100%	Assignment moved to BLS 1000 Power of Laboratory Medicine									

Program Learning Outcome 5: Students will adhere to the principles found in the American Society for Clinical Laboratory Science (ASCLS)

Assessment Mapping/Tools: 2. MLS 4870 Clinical Immunohematology / Practicum Professional Development Evaluation

Program Target: An average of 85% of students will achieve a ranking of "mastery" using corresponding rubric

Assessment Data Collection & Initial Data Analysis/Person(s) Responsible: Data collected using the corresponding assessment rubric. Responsible person: MLS Program Director Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.

Timeline (any 12 month period is acceptable): Every academic year that ends with an odd number.

Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.

	n =	# meeting target											
AY 18/19	7	7	100.00%	Clinical Microbiology Evaluation									
AY 20/21	3	3	100.00%	Clinical Immunohematology Evaluation				Updated form					
AY 22/23	5	8	62.50%	Artifact changed to ethical reflection paper to be given in Clinical Urinalysis Practicum as part of reflection in action attribute									