Affiliated Hospitals & Clinical Liaisons

1. **Aspirus Keweenaw Hospital**  
   205 Osceola St.  
   Laurium, MI. 49913  
   (906) 337-6550  
   Lab Manager: Christina Asiala, MT (AMT)  
   christina.asiala@aspirus.org

2. **Aspirus Iron River Hospital**  
   1400 W Ice Lake Rd.  
   Iron River, MI. 49935  
   (906) 265-6121  
   Lab Director: Kerri Weecks, MT (ASCP)  
   Kerri.weecks@aspirus.org

3. **Bronson Methodist Hospital**  
   601 John St.  
   Kalamazoo, MI. 49007  
   (269) 341-6440  
   Lab Manager: Bethany Peak, MBA, MLS (ASCP)  
   PeakB@bronsonhg.org

4. **Dickinson County Healthcare System**  
   1721 S. Stephenson Ave.  
   Iron Mountain, MI. 49801  
   (906) 774-1313  
   Lab Supervisor: Melissa Laurila, MT (ASCP)  
   Melissa.Laurila@dchs.org

5. **HSHS Sacred Heart Hospital/St. Joseph’s Hospital**  
   900 West Clairemont Ave.  
   Eau Claire, WI. 54701  
   (715) 717-4232  
   Lab Manager: Russell Albert, CLS (ASCP)  
   Russell.Albert@hshs.org

6. **OSF St. Francis Hospital**  
   3401 Ludington St.  
   Escanaba, MI. 49829  
   (906) 786-5707 ext. 5319  
   Lab Supervisor: Kimberly Mahoney, MLS (ASCP)  
   Kimberly.S.Mahoney@osfhealthcare.org

7. **Oscar G. Johnson VA Medical Center**  
   325 East H St.  
   Iron Mountain, MI. 49801  
   (906) 774-3300 ext. 32337  
   Lab Supervisor: Brad Tomassucci, MT (ASCP)  
   brad.tomassucci@va.gov

8. **Tripler Army Medical Center**  
   1 Jarrett White Rd.  
   Honolulu, HI. 96859  
   (808) 433-2778  
   Core Lab Manager: James Camp

9. **UP Health System – Marquette**  
   420 W. Magnetic Ave.  
   Marquette, MI. 49855  
   (906) 225-6902  
   Lab Director: Martin Renaldi, MT (ASCP), MPA  
   Martin.renaldi@mghs.org
Letter from the Director:

*Congratulations on embarking upon the next phase of your career as a Medical Laboratory Scientist!*

You have recently completed the rigorous 4 year Medical Laboratory Science Program at Michigan Tech University. This alone is something to be proud of. You have learned the basics of clinical laboratory medicine. You have participated in the didactics, the background information, the student labs, discussions, presentations, exams, and case studies. However, now, the next step. That step is putting all of the above into practice.

As you begin your clinical practicum, please keep in mind that you are still a student. The patient is the focus. The professionals you are working with have expertise in their field of study and it is your job to glean as much practical information as you possibly can. Ask a lot of questions! This is an invaluable experience so I encourage you to embrace it and make the absolute most of it.

At times this will be difficult as the demands are often great. You might even feel “in the way”. This is normal, and you will persevere! The Medical Lab Scientist community is a wonderful group of likeminded people. Their priority is always the patient and ensuring the laboratory reports are accurate and precise. Remember, 70% of all diagnostic information is from the clinical laboratory and the many scientists who deliver that information are extremely consciences.

Be proud, make your program at MTU proud, make your practicum site proud, and go on to be a successful, board certified, Medical Laboratory Scientist! You have chosen a wonderful profession, with so many opportunities. Your future is promising, and with you on board, the future of Laboratory Medicine will be more secure.

With Respect,

Karyn Fay
MLS Program Director
Mission Statement:
We equip students with the knowledge, skills, and integrity needed to successfully enter the profession of Medical Laboratory Science and other health-related professional programs.

Program Learning Goals:

Goal 1: Apply major concepts of human biology pertinent to MLS.

Goal 2: Perform laboratory skills used by clinical scientists working in a diagnostic laboratory.

Goal 3: Categorize laboratory testing and problem-solving as pre-analytical, analytical, and post-analytical.

Goal 4: Process and communicate pertinent clinical information.

Goal 5: Comprehend MLS professional issues.

Graduate Competencies:

- Demonstrate appropriate specimen collection, processing, analysis, and reporting of results in a timely manner with accuracy and precision.
- Apply safety and governmental regulations throughout the pre-analytical, analytical, and post-analytical phases of clinical laboratory testing.
- Utilize the principles and practices of professional and ethical conduct while demonstrating appropriate communication skills to sufficiently meet the needs to educate patients and other healthcare professionals.
- Demonstrate professional development through continuing education in the field of Medical Laboratory Science.
- Put into practice administrative and supervisory skills as are relevant to the healthcare system and Medical Laboratory Science field.
- Employ the use of critical thinking and problem-solving skills to identify and evaluate:
  - Calibration, maintenance, quality assurance, and any necessary corrective actions.
Appropriate confirmatory testing and reporting of abnormal patient results

- Assist with the implementation of test systems including correlational studies, reference ranges, statistical analysis, etc., to allow confident dissemination of accurate testing results

Career Entry Level Description:

At the point of career entry, the Medical Laboratory Scientist, also known as Clinical Laboratory Scientist or Medical Technologist, will have proficiency in the medical laboratory testing areas of Hematology, Chemistry, Microbiology, Immunology, and Immunohematology (blood banking). They will also have experience in newly emerging diagnostics such as Molecular Testing. This is acquired upon completion of the academic requirements at Michigan Technological University and successful completion of a Clinical Practicum.

MLS Program Accreditation:

Michigan Tech’s Medical Laboratory Science (MLS) program is accredited by the following institution:
National Accrediting Agency for Clinical Laboratory Sciences
5600 N. River Road, Suite 720
Rosemont, IL 60018, 773-714-8880
www.naacls.org

MLS Program Faculty & Staff:

During the course of your practicum, your primary university contact person will be the Clinical Practicum Coordinator.

**MLS Program Director:**
Karyn Fay, MS, MT (ASCP)SH
Dow 734
kafay@mtu.edu
Office: 906-487-2254

**MLS Clinical Practicum Coordinator:**
Kelsey Johnson, MBA, MLS(ASCP) CM
Dow 528
kelseyj@mtu.edu
Office: 906-487-2120
Cell: 906-370-4860

**MLS/Biological Sciences Lecturer:**
Brigitte Morin, MS
Dow 736
bemorin@mtu.edu
Office: 906-487-3373
**Program Director:**

The program director is responsible for the day-to-day operations of the academic program. Duties include, but are not limited to, advising students throughout the MLS program, monitoring curricular requirements in accordance with NAACLS, maintaining outcome data for the academic and clinical programs, monitoring budgetary matters, and managing continuous improvement of the MLS program.

**Clinical Practicum Coordinator:**

The clinical practicum coordinator will be the primary university contact person for practicum students and will be responsible for organizing student practicums, maintaining NAACLS accreditation, teaching the online practicum course, monitoring student progress, and maintaining ongoing communication with affiliates and practicum students.

**Prerequisites:**

Students who seek to begin their clinical practicum are required to have a degree from Michigan Technological University in Medical Laboratory Science. Course descriptions and credit hours can be found on the [MLS website](http://www.mtu.edu/biological/undergraduate/medical/).

**Criteria for admission:**

Students seeking practicum placement must submit application essays to the Clinical Practicum Coordinator. They must demonstrate the qualities and attitudes that are essential to develop as a competent professional in the MLS field (See Affective Domain objectives). Students working in the clinical setting are required to be up-to-date on their immunizations and must be able to provide proof prior to beginning their clinical practicum. Students will also be subject to background checks and drug screens prior to beginning their practicum.

**Practicum Course:**

Practicum students will enroll at Michigan Tech as a non-degree seeking student. The student will register for one, ten credit course, BL4612: SML Clinical Practicum, for the semester they begin their practicum. The recommended length for the clinical practicum is 9 consecutive months. Students will be on-site 40 hours per week for 36 weeks for a total of 1,440 hours.

*Practicum length is subject to change depending on the student’s clinical site and established programs in place. Students who are placed at some clinical sites may be required to complete a portion of their practicum at a nearby affiliated hospital for additional in-depth testing and procedures.
Clinical Practicum Assignment:

The MLS Program Officials anticipate having enough clinical sites for all students seeking placement into a practicum. If a shortage of sites does occur, students will be ranked per GPA in their MLS courses and assigned to clinical sites with regard to their preferred locations. Students who were not placed will be assigned to a clinical site as soon as one becomes available, and the program will make every attempt to avoid situations of delayed placement.

Clinical Practicum Policies & Procedures:

The student is to become familiar with and abide by all rules and policies set forth by the clinical facility to which they are assigned. Failure to comply with any of the on-site policies or respect the authority of the staff will result in removal of the student from the site and potentially the program of study.

Tuition, Fees, & Refund Policy:

Please see Student Finance Policies (http://www.mtu.edu/catalog/policies/finance/)

Student Grievance & Appeals:

Please see the Dean of Students website. (http://www.mtu.edu/deanofstudents/academic-policies/grievance/)

Liability Insurance:

Students enrolled in the MLS practicum and carrying out their practicum at an affiliated hospital are covered by professional liability coverage under Michigan Technological University’s self-insurance group, MUSIC (Michigan Universities Self Insurance Corporation).

Exposure to Biological Substances:

Students enrolled in the MLS practicum should follow the MTU Exposure Control Plan if they are exposed to any potentially infectious materials during the course of their practicum. Examples of exposure include accidental needlestick, fluid splashing into eye, etc. All exposures must be reported to the Clinical Practicum Coordinator via phone within 24 hours of the incident occurring. An incident report will be submitted to the University, so a phone call is required to obtain all necessary information as the form is filled out. Per University policies, seeking medical treatment in these events is the responsibility of the student.

Attendance:

Students must report to the clinical facility punctually in accordance with the designated rotation schedule. In the event that the student will be absent or late, he or she must notify the clinical supervisor AND clinical practicum coordinator prior to the scheduled meeting.
time. Arrangements to make up for absences must be made with the clinical site by the student. Students will have the following holidays & personal days off:


Students with a practicum of 6 months or less receive one personal and one sick day. Students with a practicum greater than 6 months receive two personal and two sick days.

Any absences above the designated amount must be made up by the student as approved by the clinical supervisor and clinical coordinator prior to completing his or her clinical practicum.

Tests and Assignments:

Tests and assignments will be available on Canvas at the start of the student’s practicum. There will be small case studies and one exam for each of the major rotational areas. These exams and case studies are to be completed in accordance with each departmental rotation. Tests and assignments should be worked on after practicum hours. On occasion, the clinical supervisor may approve time to work on the assignments. Students must score a 70% or above on the exams to sufficiently pass the exam and practicum.

At the end of the practicum, students must submit a final project or report from something relevant to their experience. This could be rare or interesting clinical findings, a project they were involved in, or new instrumentation. All patient names and identifiers must be redacted in compliance with HIPPA regulations. In addition, an overall comprehensive exam will be given at the end of the clinical practicum. Students must score an 80% or above to sufficiently pass the exam and practicum.

Additional exams, homework, or projects may be assigned by the clinical site. The student must sufficiently pass any assignments/exams given by the clinical site, per their grading scale, to successfully pass the practicum.

Each student will be given a schedule prior to the start of their practicum that contains due dates for their rotational exams, case studies and other assignments. Late submissions will result in a 5% deduction for each day the assignment is past due. If your schedule changes at any point during the course of your practicum, please let me know immediately.
Essential Functions/ Technical Performance Standards:

Essential Functions/Technical Performance Standards represent the non-academic requirements of the program. Students must be able to meet and master program essential functions, or request reasonable accommodations to successfully complete these essential functions, in order to participate in the medical laboratory science/clinical practicum programs. All applicants are expected to:

1. **Manual Dexterity:**
   Possess the gross/fine motor skills and hand/eye coordination to safely perform diagnostic procedures which includes performing phlebotomy, using chemicals, specimens, microbiology cultures, laboratory instruments and equipment, and computers

2. **Visual Acuity:**
   - Differentiate different colors and shades, characterize clarity and viscosity of medical specimens, reagents, and chemical reaction end products
   - Examine microscopic specimens and be able to differentiate color, shading, and structural differences
   - Read text, numbers, and graphs in print, on computer monitors, and hand-writing
   - Judge distance, depth, and 2 or 3 dimensional structures

3. **Physical, Mental and Emotional Health:**
   - Function for an 8 hour work day under stressful conditions
   - Be able to recognize emergency situations and react in an appropriate manner
   - Move around the hospital and laboratory freely and safely
   - Follow verbal directions with normal or corrected hearing
   - Be able to bend, stoop and stand; lift 20 pounds; maintain prolonged sitting or standing positions; perform repetitive tasks
   - Maintain concentration with distractions

4. **Behavior:**
   - Be able to work independently, with flexibility and be adaptable to change
   - Be willing to work with sharp objects, hazardous chemicals and infectious/biohazardous material
   - Recognize situations that may be potentially hazardous
   - Conduct work with honesty, compassion, ethical behavior and responsible actions
   - Work as a team in regards to learning, tasks, problem solving and patient care

5. **Intellectual and Creative Thinking:**

- Perform complex interpretive testing, possess troubleshooting skills, and exercise sound judgement
- Recognize and correct deviations in testing
- Prioritize work, be productive, and accurate within realistic time allowances

6. Communication:
The primary language for all verbal and written communication is English.

- Understand and follow verbal, non-verbal and written instructions
- Effectively communicate verbally and in writing
- Clearly present oral presentations to diverse audiences
- Comprehend technical materials: text, numbers, math, graphs, textbooks, journals, instructions, internet, manuals, etc.
- Prepare papers, reports and posters both independently and in group projects
- Take written, oral, computer and laboratory practical exams at the post-secondary level within established time frames
- Interact and communicate effectively and confidentially with laboratory peers, hospital staff, administration, and patients (it should be noted that patients will be of varying ages, and physical and mental states)
- Use computer software, instructional technology, and the Internet for purposes of communication and education

References:
1. Technical Performance Standards/Essential Functions for MTIMPM Hospital-Based Clinical Practicum Programs 8/12/13
2. ASCLS Essential Functions 2012-2016

Departmental Rotations:
The suggested departmental rotations are as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phlebotomy</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Hematology/Coagulation/Urinalysis:</td>
<td>10 weeks</td>
</tr>
<tr>
<td></td>
<td>Hematology: 6 weeks</td>
</tr>
<tr>
<td></td>
<td>Coagulation: 2 weeks</td>
</tr>
<tr>
<td></td>
<td>Urinalysis: 2 weeks</td>
</tr>
<tr>
<td>Chemistry/Serology:</td>
<td>7 weeks</td>
</tr>
<tr>
<td></td>
<td>Chemistry: 5 weeks</td>
</tr>
<tr>
<td></td>
<td>Serology: 2 weeks</td>
</tr>
<tr>
<td>Microbiology:</td>
<td>9 weeks</td>
</tr>
<tr>
<td>Blood Bank:</td>
<td>6 weeks</td>
</tr>
<tr>
<td></td>
<td>34 weeks</td>
</tr>
</tbody>
</table>
The remaining 2 weeks will be scheduled at the discretion of the clinical supervisor at each clinical site, for a total of 36 weeks.

On occasion, clinical sites may schedule students for afternoon, midnight, or weekend shifts to meet performance objectives. This may be in the event that quality control, maintenance of analyzers, certain tests/procedures are only carried out on these shifts. It is beneficial for students to experience the workload of varying shifts, as many new techs start do not start out on day shift.

Rotational length is subject to change with each clinical site and will be communicated to the student prior to the start of the practicum.

**Performance Objectives:**

Students should be able to perform all laboratory procedures described in the performance objectives to the satisfaction of the student, the clinical supervisor and the clinical coordinator. Students should demonstrate a professional and responsible attitude through performance of procedures, concern for patient care and safety, and cooperation and respect for laboratory supervisors and co-workers.

**Evaluation:**

**It is your responsibility to give these to your clinical instructors/lead techs at the BEGINNING of your rotation in their department.** Clinical instructors will complete the evaluation forms at the middle and end of each departmental rotation. Evaluations will be based on the student’s bench work (psychomotor), as well as their professionalism (affective). **Students must receive a satisfactory affective evaluation, and an average of 80% for each psychomotor departmental rotation to successfully complete the clinical practicum.** The evaluation forms will become part of the student’s clinical practicum file at Michigan Tech.

**Final Grade:**

Students will be given a grade of P (Progress) until completion of the practicum, when a letter grade will be calculated. To obtain a passing grade, students must:

- Pass all rotational exams with a grade of 70% or above
- Sufficiently complete all rotational case studies
- Complete the final project/case study with a grade of 70% or above
- Turn in completed/signed affective evaluations from clinical instructors with satisfactory scores
- Turn in completed/signed psychomotor evaluations from clinical instructors with an average of 80% or higher for each departmental rotation
- Pass the comprehensive final exam with a grade of 70% or above
- The final grade for each departmental rotation will be an average of exams and bench work. The final grade for the course will be an average of department grades, final project grades, and post-clinical exam grade.

- The following grading scale will be used for letter grades:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93% - 100%</td>
</tr>
<tr>
<td>AB</td>
<td>85% - 92.9%</td>
</tr>
<tr>
<td>B</td>
<td>80% - 84.9%</td>
</tr>
<tr>
<td>BC</td>
<td>75% - 79.9%</td>
</tr>
<tr>
<td>C</td>
<td>70% - 74.9%</td>
</tr>
<tr>
<td>CD</td>
<td>65% - 69.9%</td>
</tr>
<tr>
<td>D</td>
<td>60% - 64.9%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60%</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete; given only when a student is unable to complete a segment of the course because of circumstances beyond the student’s control. A grade of incomplete may be given only when approved in writing by the department chair or school dean.</td>
</tr>
<tr>
<td>X</td>
<td>Conditional, with no grade points per credit; given only when the student is at fault in failing to complete a minor segment of a course, but in the judgment of the instructor does not need to repeat the course. It must be made up within the next semester in residence or the grade becomes a failure (F). A (X) grade is computed into the grade point average as a (F) grade.</td>
</tr>
</tbody>
</table>

**Service Work Policy:**

1. Students are not to be used as substitutes for qualified staff.
2. Students are only permitted to perform procedures when supervised by qualified staff until competency is established.
3. Laboratory staffing should not rely upon student work.
4. The student’s work in each rotation should be signed/co-signed by the appropriate bench tech.
5. If the student is also an employee, the student will not be evaluated as part of the educational process, when activities are performed while in the employee capacity.

**Dismissal of Students:**

MLS program officials will monitor student progress during their time at clinical sites. Any of the following behaviors or actions will result in consequences, which may include dismissal from the practicum:
A. Dishonesty
   a. It is important to create a trustworthy atmosphere in the clinical setting. If there is sufficient evidence that a student is lying/cheating, he or she will face one or more of the following consequences:
      i. Permanent removal from the MLS program.
      ii. Suspension of the student from the program for an amount of time to be determined by the Clinical Coordinator and Clinical Supervisor, with the opportunity to continue after suspension
      iii. Receive a letter grade of “F” in the section(s) that were most affected by the behavior

B. Violation of Confidentiality
   a. Patient information is highly confidential. This information may only be disclosed to other laboratory colleagues, the attending physician, the pathologist, and other approved personnel. A violation of confidentiality is a serious problem and will result in one or more of the following consequences described above (under section A).

C. Chronic tardiness or absences
   a. All absences must be approved by the clinical supervisor prior to the day the student is to be absent. Any unapproved absences must be made up by the student before he/she may complete their practicum. In consultation with the Clinical Coordinator, the Clinical Supervisor may recommend appropriate make up times. These may include weekends, afternoon shifts, or at the “end” of the clinical practicum. Excessive tardiness and absences will result in a careful review of the student’s progress and one or more of the above consequences (section A) may follow.

D. Arriving at the clinical site with impaired functional abilities
   a. Arriving at the clinical site under the influence of drugs or alcohol, with lack of sleep, or for any other reason that would prevent the student from satisfactorily performing his or her duties will not be tolerated. One or more of the consequences listed under section A may follow.

Health Information Portability and Accountability Act (HIPAA):
The Health Information Portability and Accountability Act (HIPAA) of 1996 provides the national standard for protecting individuals’ medical records and other personal health information. Students are provided with information on the Privacy Rule while in the MLS program and at pre-practicum orientation. Disclosure of patient information to any unauthorized person could result in fines or imprisonment, and is ground for dismissal from the program. Never discuss
patient results outside of the laboratory and do not release any patient information to unauthorized individuals.

**Professional Appearance Policy:**

Pursuing a career in Medical Laboratory Science results in working directly with patients, physicians, administration, and the public in general. Consequently, your appearance in these situations is important and serves as part of your first impression. Each clinical setting will have their own specific regulations that the student must follow while completing their practicum. While each of these policies may vary slightly, the department has come up with a comprehensive code that reflects the most typical policies found in clinical settings that the student is required to abide by while completing their practicum.

1. No open-toed shoes are to be worn at the clinical site. Athletic shoes may be acceptable, but they must be clean and not scuffed.
2. Fingernails should be kept clean, free from nail polish, and short (a maximum of ¼ in. past the tip of the fingernail), as long nails have been shown to harbor microorganisms. Artificial nails (including but not limited to acrylcs, wraps, tips) are prohibited.
3. Hair should be kept neat and clean with no unnatural colors (purple, blue, etc.). Long hair must be neatly pulled back away from the face.
4. Personal hygiene is important and must be maintained throughout the clinical practicum experience. Perfumes and colognes must be avoided, as some patients and colleagues may be particularly sensitive to these.
5. In the event that the student does not wear scrubs, clothing must remain professional. Dress pants and collared shirts are preferred. Cargo pants, shorts, jeans, leggings, yoga pants, and low cut tops are unacceptable.
6. Jewelry and rings should be kept to a minimum, especially those that interfere with proper use of nitrile gloves. Visible body piercings should be limited to just the ears. All other visible body piercings must be removed while in the clinical setting.
7. All visible tattoos should be covered by clothing, long sleeves, etc.

**Professional Behaviors:**

1. Foul language is inappropriate and should not be used at any time in the clinical setting.
2. Students must treat their coworkers, patients, and other hospital staff with respect at all times.
3. Food and drinks are prohibited in the lab at all times.
4. Cell phones are prohibited in the lab and should only be used during breaks or lunch time. However, it is encouraged that the student limits their use and takes the time to interact with and get to know their colleagues.

**Clinical Practicum Appropriate/Recommended Behavior:**

As a student:
1. Be involved with and observe as many tests and procedures as possible.
2. Use free time during the day to study your notes and textbooks if approved by the clinical supervisor.
3. Establish neat and organized work habits.
4. Ask for assistance with procedures you are unfamiliar with or unsure of. Refer to procedure manuals rather than always using other laboratory staff as a crutch.
5. If you have been sufficiently trained and signed off on a task or test, take the initiative to perform it yourself without waiting to be asked.
6. Review your performance with the clinical supervisor regularly to determine areas in which you can improve.
7. Be sure to follow all hospital, lab, and departmental policies and procedures.
8. Be aware of your departmental rotations throughout the lab, and know who you report to and at what time.
9. Observe all rules on professional appearance and behavior.

As a professional:

1. Always maintain patient confidentiality and abide by all HIPAA regulations.
2. Address patients respectfully and state your name and department upon entering patient rooms. Treat patients and their family members with compassion and empathy.
3. Check patient wristbands or ask for a second identifier, such as date of birth, to ensure you have the correct patient.
4. Always label patient specimens at the bedside – do not remove patient specimens from the room prior to labeling them.
5. Clearly state your name and department when answering the telephone.
6. Always arrive on time.
7. Observe hospital procedures for entering room with special precautions, such as isolation rooms.
8. Follow departmental rules and regulations and observe the dress code.
9. Be respectful of your coworkers and other hospital staff.

Safety:

1. Wash hands regularly and abide by all hand washing regulations set by the clinical site.
2. Proper personal protective equipment (PPE) is to be worn in the laboratory as well as in other areas of the hospital (patient rooms, isolation rooms) as indicated by the clinical site.
3. Be sure that you have been properly trained on all equipment prior to using it.
4. Make sure all tools and equipment is in safe working order.
5. Report any accidents, safety concerns/hazards, defects in tools or equipment to the lab supervisor immediately.
6. Always ask for help before doing anything that you are not confident you can do on your own.
7. Be sure you know where to locate fire extinguishers, as well as how to operate them.
8. Keep flammable material and reagents away from fire and heat.
9. Abide by all safety regulations set by the clinical practicum site.

**MTU MLS Program Learning Objectives**

**Specimen Collection:**
1. Demonstrate knowledge and proficiency of the following blood collection procedures:
   a. Patient identification and preparation
   b. Collection device selection and usage
   c. Order of draw
   d. Aseptic technique
   e. Specimen labeling and handling
   f. Capillary and venous collection
   g. Proper use of PPE and adherence to hospital safety regulations

**Hematology:**
1. Identify and describe the cellular components of blood, bone marrow, and body fluids.
2. Identify and describe the function of the cellular components of blood, bone marrow, and body fluids.
3. Prepare and evaluate blood smears in a timely and accurate manner for the following:
   a. WBC differentials – normal and abnormal
   b. WBC estimate
   c. Platelet estimate
   d. RBC morphology – normal and abnormal
4. Correlate cell morphology and patient values with the correct pathological states.
5. Properly employ the use of various cytochemical stains.
6. Demonstrate the following manual procedures and/or calculations accurately:
   a. Erythrocyte sedimentation rate (ESR)
   b. Reticulocyte counts
   c. RBC indices
   d. WBC correction for nucleated RBC’s
   e. Fluid cell counts
7. Employ the use of additional routine or confirmatory testing to the level of accuracy established by the laboratory.
8. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
9. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
   c. Identify instrumental causes of unexpected patient results
d. Troubleshoot all analyzer malfunctions
  e. Perform regular preventative maintenance and repairs

**Coagulation:**

1. List the steps and factors in the coagulation scheme.
2. Perform automated, semi-automated, and manual testing with the level of accuracy established by the laboratory for the following tests:
   a. Prothrombin time (INR); with significance of ISI
   b. Activated partial thromboplastin time
   c. Fibrinogen
   d. D-dimer
   e. Factor assays
   f. Mixing studies
   g. Anticoagulant therapy
3. Correlate patient values with pathological or therapeutic states.
4. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
5. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
   c. Identify instrumental causes of unexpected patient results
   d. Troubleshoot all analyzer malfunctions
   e. Perform regular preventative maintenance and repairs

**Urinalysis:**

1. Explain the structure and function of the urinary tract.
2. Perform automated, semi-automated, and manual testing with the level of accuracy established by the laboratory for the following tests:
   a. Urinalysis
   b. Urine pregnancy tests
   c. Other miscellaneous urinalysis tests
3. Identify, analyze, and report the physical and chemical properties and urine constituents.
4. Identify and explain the presence of normal and abnormal elements found in the microscopic examination of urine sediment.
5. Recognize and explain the presence of contaminants and artifacts in the microscopic examination of urine sediment.
6. Explain the chemical reaction of tests and accurately correlate their results to pathological states.
7. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
8. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
   c. Identify instrumental causes of unexpected patient results
   d. Troubleshoot all analyzer malfunctions
   e. Perform regular preventative maintenance and repairs
Chemistry:

1. Describe specified clinical chemistry assays with reference to the principles of the procedure and chemical reactions involved.
2. Accurately perform procedures including:
   a. Spectrophotometry
   b. Electrophoresis and densitometry
   c. Enzyme immunoassay
   d. Blood gas analysis
   e. Osmometry
   f. Automated instrumentation analysis
3. Apply the appropriate mathematical calculations to practical laboratory situations.
4. Recognize normal and abnormal patient values and correlate results with pathological or therapeutic states.
5. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
6. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
   c. Identify instrumental causes of unexpected patient results
   d. Troubleshoot all analyzer malfunctions
   e. Perform regular preventative maintenance and repairs

Microbiology:

1. Perform a variety of bacteriological procedures to demonstrate proficiency in identifying 90% of usually occurring bacteria
2. Perform and accurately interpret the laboratory-established procedures for each of the following:
   a. Inoculation and streaking of aerobic and anaerobic organisms
   b. Gram stain and microscopic examination of clinical materials and culture isolates
   c. Identification of aerobic and anaerobic bacteria by serological, biochemical, and antimicrobial testing
   d. Sensitivity testing
   e. Acid fast staining
   f. Ova and parasites
   g. Fungus identification
   h. Blood cultures
   i. Wet preps
3. Differentiate normal and pathogenic flora.
4. Correlate abnormal patient results with the appropriate pathogenic states.
5. Describe the principles and procedures of molecular testing.
6. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
7. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
c. Identify instrumental causes of unexpected patient results
d. Troubleshoot all analyzer malfunctions
e. Perform regular preventative maintenance and repairs

**Immunohematology:**

1. Explain the basic methods and principles of immunohematology testing.
2. Explain the significance of special requirements with regard to:
   a. Patient identification
   b. Specimen labeling
   c. Transcription of results
   d. Record keeping
   e. Release of units for transfusion
   f. Emergency uncrossmatched release
3. Perform the following procedures on patient specimens with 100% accuracy and correct interpretation:
   a. ABO and Rh
   b. Antibody screen
   c. Weak D testing
   d. Antibody identification
   e. Direct and Indirect Antiglobulin tests
   f. Pre-transfusion crossmatch and compatibility testing
   g. Elutions, adsorptions, neutralizations
   h. Titers
   i. Donor unit processing of components
   j. Rh Immune Globulin
   k. Transfusion reaction
4. Describe, perform, evaluate, and interpret immunohematology testing required for blood and blood component therapy
5. Correlate results with patient condition.
6. Describe blood components currently available for therapeutic use with regard to:
   a. Storage
   b. Preparation
   c. Infusion
   d. Indications for use
   e. Leukocyte reduction methods
   f. Irradiation
   g. Autologous/directed donation
7. List the general health requirements, disease markers, and reasons for exclusion of potential blood donors
8. Select the appropriate components for patient transfusion given their blood type, antibody screen, and patient history.
9. Appropriately prioritize patient work with regard to urgency of the situation.
10. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
11. For instrumentation and equipment:
Immunology/Serology:

1. Identify the cells and organs of the immune system and explain their functions.
2. Describe immunologic principles for the method of testing performed, including the limitations of the test system and diagnostic significance of the results.
3. Accurately perform or discuss the following procedures:
   a. Serologic screening, serial dilutions and titers
   b. Flocculation, latex and RBC agglutination
   c. Precipitation methods
      i. RID
      ii. Ouchterlony
   d. Immunelectrophoresis/Immunofixation
   e. ELISA
   f. Direct and indirect immunofluorescence
   g. Flow cytometry
4. Maintain efficient work area by keeping area clean and replenishing supplies and reagents.
5. For instrumentation and equipment:
   a. Describe the principle of operation and key components
   b. Perform necessary calibrations and quality controls
   c. Identify instrumental causes of unexpected patient results
   d. Troubleshoot all analyzer malfunctions
   e. Perform regular preventative maintenance and repairs

Management/Education:

1. Distinguish between cognitive, affective, and psychomotor domains.
2. Prepare a resume and cover letter.
3. Explain routine maintenance and calibration of laboratory equipment and identify necessary corrective action to maintain quality controls.
4. Identify and explain pre-analytical, analytical, and post-analytical sources of error in laboratory testing.
5. Explain the principles of laboratory management, supervision, and continuing education.
6. Demonstrate communication skills with all levels of hospital personnel while maintaining professional and ethical conduct.
7. Describe the integration of laboratory information systems (LIS) with electronic health records.
8. Discuss the process of certification, accreditation, proficiency and competency testing, and laboratory inspection.

Off-Shift (afternoons, midnights, weekends) Rotations:
1. Perform scheduled maintenance and cleaning routinely performed during off-shifts.
2. Accurately perform quality control testing and analyzer calibrations routinely performed during off-shifts.
3. Accurately perform testing on specimens that are “batched” or only analyzed during off-shifts.
4. Demonstrate the ability to prioritize tasks and work efficiently.

**MLS Certification Exam Application Information**

The purpose of your practicum is to gain hands-on learning experience that will adequately prepare you to sit for the ASCP Board of Certification (BOC). The BOC is considered the gold standard in certification, and should be taken soon after your practicum is complete. The longer you wait to take your boards, the less hands-on information you may retain. If you don’t use it, you lose it.

In addition to ASCP BOC review books, the BOC offers a *study guide app*, content outlines, and suggested reading lists, along with online practice tests to ensure that you have sufficiently prepared yourself for the exam.

For those of you with plans to relocate, keep in mind that successful certification by the BOC does not automatically grant you a state license. The requirements for licensure vary by state and must be met to become licensed in a state. It would be a good idea to review state requirements if you have definite plans to relocate after your practicum.

**Program Information for Certification**

Examination Category and Route: Medical Laboratory Scientist (MLS) Route 1

Accredited Program Information: NAACLS

Date Program Began: Introduction to MLS (BL 1600)

Date Program Ends: End of Practicum

**Certification Process**

The following information was obtained from the ASCP BOC website. This is a very small excerpt, and you should review this website thoroughly on your own prior to the certification process to ensure no changes have been made and you complete all of the necessary steps and documentation required to sit for your boards. The document can be accessed by visiting www.ASCP.org and navigating to the Board of Certification tab.

One important thing to note: Once you submit your application, you have a three month window to sign up to take the boards. If you fail to sign up within this three month period, you lose your application fee and will have to pay again the next time you apply.
Step 1: Meet the eligibility requirements for the appropriate examination category as shown on pages 4 – 17 before submitting your application. You MUST indicate a route of eligibility on your application or it will not be processed.

**MLS(ASCP) Medical Laboratory Scientist**

To be eligible for this examination category, an applicant must satisfy the requirements of at least one of the following routes

A Route of Eligibility MUST be indicated on your application. If no Route of Eligibility is designated, your application will not be processed.

**Route 1:** A baccalaureate degree from a regionally accredited college/university including courses in biological science, chemistry and mathematics, AND successful completion of a NAACLS accredited Medical Laboratory Scientist program within the last 5 years.

The education received from a NAACLS accredited MLS program is acceptable for a period of five (5) years from the date of completion of that program. After five years, the applicant’s eligibility will be based on clinical laboratory experience as stated in the current examination eligibility requirements; OR

Step 2: Complete the online application (see page 22) and submit the following:

- Appropriate application fee (credit card or check).
  - Application fees are non-refundable. The 2017 application fee is $240.
- Necessary documentation required to verify your eligibility (see pages 18 – 21) – you must submit your official transcript to the ASCP.

Step 3: Receive notification by email to take the examination on computer at a Pearson Professional Center within a three-month period, upon determination of your examination eligibility.

Step 4: Schedule an appointment to take the examination within the three-month period indicated in your admission notification.

Step 5: Take the examination at the Pearson Professional Center of your choice. (Appendix A, page 32) Immediately after you complete the examination, you will see your preliminary pass/fail result on the computer screen.

Step 6: Receive notification email to login and view your final examination score.

Step 7: Receive your certificate in approximately 4-6 weeks verifying your certification upon passing the examination, valid for three years, and the Credential Maintenance Program booklet containing information on maintaining your certification.
Evaluations
Performance Objectives Evaluation Scale

Please use the following scale and descriptions for evaluation of the student’s performance in each department during their clinical rotation. **The student is responsible for ensuring that all evaluations have been completed/signed off, as well as returning them to the Clinical Practicum Coordinator as they complete departmental rotations.**

5: Exceptional (100%): The student can complete all objectives/procedures ahead of schedule with a high degree of competency and self-direction. The student seeks out additional tasks, when appropriate, and goes beyond what is expected of them. Excellent teamwork and communication skills. Accurately performs testing, work rarely needs repeating. Excellent, well-organized work habits. Quickly recognizes potential discrepancies/problems and identifies the correct course of action. Requires minimal prompting from supervisors by the end of each departmental rotation, catches on to new procedures quickly, performs tasks with confidence and independence.

4: Above average (90%): The student is highly motivated and completes objectives/procedures on time with an acceptable level of competency. The student willingly accepts additional tasks, when appropriate. Performs tasks with a high degree of accuracy, occasionally needs to repeat work. Good work habits, teamwork and communication skills. Recognizes potential discrepancies/problems and can determine an accurate course of action with little prompting from peers. Requires occasionally prompting from supervisors when performing tasks independently by the end of each departmental rotation.

3: Average (80%): The student can complete most objectives/procedures in a timely fashion with an acceptable level of competency, but improvement is necessary. Acceptable work habits, teamwork, and communication skills. Average performance; repeat work is occasional in frequency. Input from peers may be needed to determine appropriate course of action when problem solving but student demonstrates sufficient follow through. Requires supervision and guidance when performing tasks independently by the end of each departmental rotation.

2: Below Average (70%): Additional time needed to be able to complete objectives/procedures at a desirable level of confidence and independence. Requires nearly constant guidance and prompting to be able to accurately and sufficiently perform tasks by the end of each departmental rotation. Repeat work is frequent; performance requires significant improvement. Has a difficult time recognizing discrepancies or potential problems. Does not respond well to constructive feedback, lacks appropriate communication skills.

1: Unacceptable (60%): Is unable to accurately or sufficiently complete objectives/tasks. Requires constant supervision or is unable to perform testing. Does not recognize
potential problems or discrepancies and makes significant mistakes that would compromise patient safety. Has poor time management, teamwork, and communication skills.
Evaluation of Psychomotor Objectives:

Clinical instructors: Please use the psychomotor grading scales and descriptions to complete the evaluations for each departmental rotation.

Students: You are responsible for ensuring completion and submission of the objectives to the Clinical Practicum Coordinator following each departmental rotation. When mailing them in, please make a copy to retain for your records and submit the original. **You must receive an average of 80% or above on your psychomotor evaluations to sufficiently pass.**

<table>
<thead>
<tr>
<th>Bench work</th>
<th>Mid-rotation evaluation score</th>
<th>End-rotation evaluation score</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-solving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to perform independently</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to work as part of a team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average scores</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mid-rotation evaluator signature & date: ________________________________________________

Student Signature & date: ___________________________________________________________

End-rotation evaluator signature & date: _____________________________________________

Student signature & date: ________________________________________________________
Description of Affective Objectives:

Please use these descriptions as a guide when evaluating the student on affective objectives.

I. Affective Domain

1. The student consistently adheres to safety rules in all areas of the laboratory by:
   a. Washing hands frequently
   b. Not eating, drinking, or applying make-up in the laboratory
   c. Wearing gloves, lab coat and protective eye wear as the lab policy states
   d. Reporting all accidents to the supervisor immediately
   e. Processing and disposing of all biohazard substances appropriately
   f. Following all laboratory and hospital safety rules set by the clinical facility

2. The student demonstrates punctuality and attendance by:
   a. Arriving to the clinical site as scheduled on time and prepared to begin
   b. Returning from designated breaks on time
   c. Completing all rotational exams on time
   d. Performing laboratory tasks as assigned in a timely manner

3. The student maintains a neat and professional appearance and workspace by:
   a. Adhering to the dress code set by the clinical site
   b. Maintaining personal hygiene
   c. Keeping long hair pulled back from the face
   d. Routinely cleaning and organizing the bench, ensuring its neatness

4. The student demonstrates an eagerness to learn and improve by:
   a. Asking relevant questions to further his or her knowledge of medical laboratory sciences
   b. Following directions given by supervisors
   c. Asking questions when unsure of a policy or procedure
   d. Effectively responding to constructive feedback

5. The student maintains a helpful, positive attitude by:
   a. Performing all tasks willingly
   b. Being respectful to all hospital staff and personnel
   c. Not becoming defensive when given constructive feedback
   d. Helping others in the lab when appropriate
   e. Not becoming discouraged during the learning process

6. The student demonstrates that he or she possesses appropriate interpersonal skills by:
   a. Communicating effectively with hospital staff and patients
   b. Answering phones with appropriate etiquette
   c. Being a respectful, courteous listener and responding promptly to questions
   d. Using cellphones only when appropriate (break, lunch)

7. The student handles the potential stresses of the laboratory appropriately by:
a. Ensuring all supplies are kept well-stocked  
b. Working diligently, efficiently and prioritizing work as necessary  
c. Staying focused on the tasks at hand  

8. **The student demonstrates professional ethics by:**  
a. Maintaining patient confidentiality and abiding by all HIPAA regulations  
b. Does not discuss patient findings unless necessary in carrying out his or her duties  
c. Reporting patient results only to the correct authorized personnel  
d. Being upfront and honest about potential errors or near-misses  
e. Treating all patients with respect and kindness  
f. Not gossiping about hospital staff or patients
Evaluation of Affective Objectives:

Clinical instructors: Please use the descriptions above to complete the evaluations for each departmental rotation. Affective objectives are graded as satisfactory or unsatisfactory. If a grade of unsatisfactory is recorded, please be sure to specify the reason in the comments.

Students: You are responsible for ensuring completion and submission of the objectives to the Clinical Practicum Coordinator following each departmental rotation. When mailing them in, please make a copy to retain for your records and submit the original. Affective objectives are graded as satisfactory or unsatisfactory.

<table>
<thead>
<tr>
<th>Professionalism</th>
<th>Satisfactory/Unsatisfactory</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punctuality/Attendance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neatness of appearance/work space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desire to learn and improve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling laboratory environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional ethics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluator signature & date: ________________________________

Student signature & date: _________________________________
2017-2018 Medical Laboratory Science Clinical Excellence Award

Nomination Form

Students who participate in a clinical practicum are eligible to be nominated for Michigan Tech’s Medical Laboratory Science Clinical Excellence Award. This award serves to recognize students for their outstanding contribution to the laboratory with regard to professionalism, skill, teamwork, leadership, and integrity. The recipient will be chosen by the MLS Program Faculty based on nominations from students’ clinical sites.

Give this to your clinical site during the last month of your practicum.

Laboratory Managers: Please return this form to the MLS Practicum Coordinator at the end of the student’s practicum if you would like to nominate them for the award.

Student Name:

Clinical Practicum Site:

Reason for nomination:

Clinical Instructor Signature:

Date: