

**Northern Michigan University**  
**College of**  
**Health Sciences and Professional Studies**

**Clinical Laboratory Sciences**

**Policy Manual**

2023 - 2024 Edition

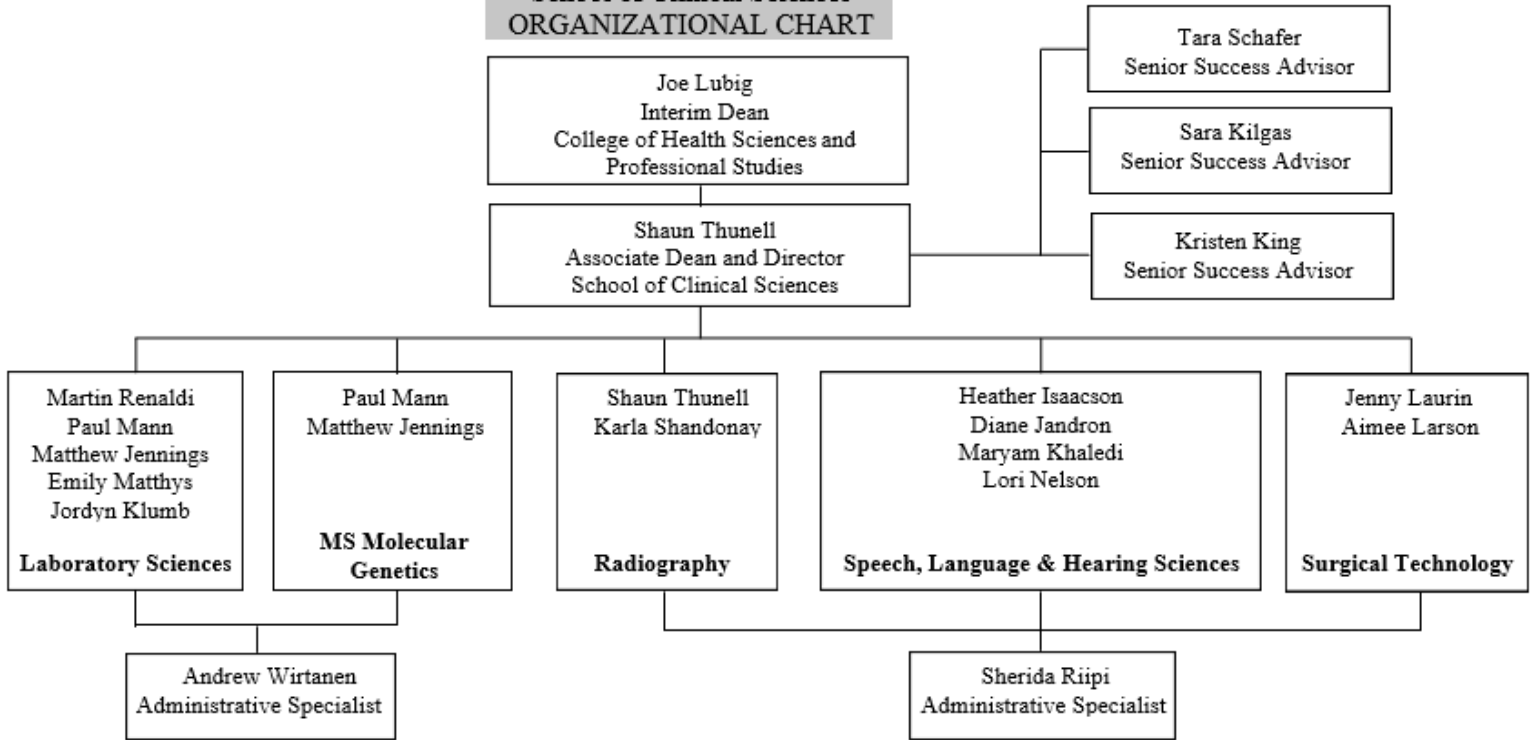
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Please reference the most current policy manual online at:  
[https://nmu.edu/clinicalsciences/students#accordion\\_collapse\\_579](https://nmu.edu/clinicalsciences/students#accordion_collapse_579)

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# NMU and School of Clinical Sciences Profile

Northern Michigan University  
 School of Clinical Sciences  
**ORGANIZATIONAL CHART**



## **NMU Admissions Policies**

### **Admission Requirements and Application Procedures**

Admission requirements can be reviewed in the undergraduate and graduate bulletins, respectively.

#### *Undergraduate Bulletin*

<https://nmu.edu/bulletin/undergraduate-admissions-policies>

#### *Graduate Bulletin*

<https://nmu.edu/graduatebulletin/admission-requirements>

#### *Application Procedures*

<https://nmu.edu/admissions/apply-student-type>

### **Transfer Credit Policy**

<https://nmu.edu/bulletin/transfer-credit-policy>

## **NMU Tuition and Refunds**

### **Undergraduate and Graduate Student Tuition and Fees**

<https://www.nmu.edu/tuition>

### **Payment Plans**

<https://www.nmu.edu/student-service-center/payment-plans>

### **Senior Citizen Scholarship**

<https://nmu.edu/bulletin/senior-citizen-scholarship>

### **Add/Drop Procedures**

<https://nmu.edu/registrar/add-drop-procedure>

### **Withdrawal Deadlines and Refunds**

<https://nmu.edu/registrar/withdrawal-deadlines>

## **Student Grievance and Appeals**

Students who have complaints concerning grades or other matters should follow the appeals procedure outlines in the NMU Student Handbook at: <https://nmu.edu/policies/1070>.

Student complaints concerning grades is found in 1.2.1. Complaints other than grades is in 1.2.2.

Procedures to register complaints, grievances, exceptions and appeals can be found here: <https://nmu.edu/dso/complaints-grievances-exceptions-and-appeals>

## **Confidentiality and Impartiality Policies and Procedures**

NMU faculty and staff follow policies and procedures that ensure student confidentiality and impartiality.

### **FERPA**

<https://nmu.edu/policies/898>

### **HIPAA**

<https://www.hhs.gov/hipaa/index.html>

### **Non-Discrimination Policy**

<https://nmu.edu/policies/685>



## **Academic Calendar**

The NMU academic calendar is posted online at: <https://nmu.edu/registrar/academiccalendar>

# Clinical Laboratory Sciences Programs Profile

## Accreditation/Approval Agencies

### **National Accrediting Agency for Clinical Laboratory Sciences**

5600 N. River Road, Suite 720

Rosemont, IL 60018-5119

Phone: 773-714-8880

The **Clinical Laboratory Technician and Clinical Laboratory Scientist** programs are accredited by the National Accrediting Agency for Clinical Sciences (NAACLS) with Northern Michigan University as the sponsoring agency.

The **Histotechnologist** program is accredited by NAACLS with the clinical affiliates as the sponsoring agencies.

### **Commission on Accreditation of Allied Health Education Programs**

9355 – 113<sup>th</sup> St. N, #7709

Seminole, FL 33775

Phone: 727-210-2350

### **Higher Learning Commission**

230 South LaSalle St. Suite 7-500

Chicago, IL 60604

Phone: 312-263-0546

Northern Michigan University is accredited by the Higher Learning Commission.

## **Clinical Sciences Faculty and Affiliations**

### **NORTHERN MICHIGAN UNIVERSITY**

- Dr. Joe Lubig, Interim Dean, College of Health Sciences and Professional Studies (jlubig@nmu.edu)
- Dr. Shaun Thunell, Associate Dean and School of Clinical Sciences Director, Radiography Program Director (sthunell@nmu.edu)
- Mr. Martin Renaldi, Clinical Laboratory Sciences Program Director, Assistant Professor (mrenaldi@nmu.edu)
- Ms. Emily Matthys, Assistant Professor (ematthys@nmu.edu)
- Dr. Paul Mann, Professor (pmann@nmu.edu)
- Dr. Matthew Jennings, Assistant Professor (majennin@nmu.edu)
- Ms. Jordyn Klumb, Special Instructor (jklumb@nmu.edu)

### **Clinical Sciences Affiliated Hospitals and Adjunct Clinical Faculty (Courtesy Appointments)**

#### **Clinical Laboratory Technician Program**

Advocate Aurora Health ACL Laboratories, numerous locations

Lab Manager: numerous

Liaison: Marzena Horembala, MS, SBB (ASCP)

Aspirus Iron River Hospital & Clinics, Iron River, MI

Lab Manager and Liaison: Kerri Weecks, MT(ASCP)

Aspirus Ironwood Hospital, Ironwood, MI

Lab Manager and Liaison: Dennis Aspinwall, MT(ASCP)

Aspirus Keweenaw Hospital, Laurium, MI

Lab Manager and Liaison: Melissa Loukus

Baraga County Memorial Hospital, L'Anse, MI

Lab Manager and Liaison: Susan Copley, MT(ASCP)

Bellin Health, Green Bay, WI

Lab Manager: Tyler Radke, MLS(ASCP)CM

Liaison: Leah Borchardt, MLS(ASCP)

Bronson Healthcare Group, Kalamazoo, MI

Lab Manager and Liaison: Bridget Yager, MLS(ASCP)

Community Health Center of Branch County, Coldwater, MI

Lab Manager and Liaison: Jill Duke, MT(ASCP)

Essentia Health, Duluth, MN

Lab Manager: Michael Schrandt, MT(ASCP)

Liaison: Denise Miller, MT(ASCP)

Helen Newberry Joy Hospital, Newberry, MI  
Lab Manager and Liaison: Michelle Leazier, MT(AAB)

Marshfield Medical Center Dickinson, Iron Mountain, MI  
Lab Manager and Liaison: Charlie Burridge, MLS(ASCP)

McLaren Northern Michigan, Petoskey, MI  
Lab Manager and Liaison: Simon Milbrandt, MLS(ASCP)

Memorial Medical Center, Ashland, WI  
Lab Manager: Krista Jack, MLS(ASCP)  
Liaison: Patti Senk, PHD, RN

MidMichigan Medical Center - West Branch, West Branch, MI 48661  
Lab Manager and Liaison: Karen Mercer, MLS(ASCP)MSA

Munson Healthcare Otsego Memorial Hospital, Gaylord,  
Lab Manager: Wendy Stock, MT(HEW)  
Liaison: Kurt Cancilla, MT(ASCP)

MyMichigan Medical Center Sault, Sault Ste. Marie, MI  
Lab Manager and Liaison: Jennifer Kabat, MLS(ASCP)  
Lab Manager and Liaison: Claire LaPlaunt, MLS(ASCP)

Oscar G. Johnson VAMC, Iron Mountain, MI  
Lab Manager: Stephen Richey, MLS(ASCP)  
Liaison: Bridget Grosskopf, MLS(ASCP)

Schoolcraft Memorial Hospital, Manistique, MI  
Lab Manager and Liaison: Hank Richey, MLS(ASCP)

UP Health System – Bell, Ishpeming, MI  
Lab Manager and Liaison: Gerry Brown, MT(ASCP)

UP Health System – Portage, Hancock,  
Lab Manager and Liaison: Jennifer Heltunen, MT(ASCP)

Wakemed, Raleigh, NC  
Lab Manager and Liaison: Lindsay Kimbrell, MLS(ASCP)

### **Clinical Laboratory Scientist Programs**

Advocate Aurora Health ACL Laboratories, numerous locations  
Lab Manager: numerous  
Liaison: Marzena Horembala, MS, SBB (ASCP)

Bronson Healthcare Group, Kalamazoo, MI  
Lab Manager and Liaison: Bridget Yager, MLS(ASCP)

Essentia Health, Duluth, MN

Lab Manager: Michael Schrandt, MT(ASCP)

Liaison: Denise Miller, MT(ASCP)

Hurley Medical Center, Grand Rapids, MI

Liaison: Angela Schroeder

Liaison: Kristi Richardson, MLS(ASCP)CM

Genesys Regional Medical Center, Grand Blanc, MI

Lab Manager and Liaison: Justin Hill, MLS(ASCP)<sup>CM</sup>

Michigan Department of Health and Human Services, Lansing, MI (Microbiology)

Lab Manager: Marty Soehnen, Ph.D., MPH, HCLD(ABB)

Liaison: Tonya Heyer, MLS

McLaren Northern Michigan, Petoskey, MI

Lab Manager and Liaison: Simon Milbrandt, MLS(ASCP)

Oscar G. Johnson VAMC, Iron Mountain, MI

Lab Manager: Stephen Richey, MLS(ASCP)

Liaison: Bridget Grosskopf, MLS(ASCP)

Sparrow Hospital, Lansing, MI

Lab Manager and Liaison: Jon Baker

St. Mary's Hospital, SSM, Madison, WI

Lab Manager: Ken Chantavat, MLS(ASCP)

Liaison: Ann Dolan, MLS(ASCP)

University of Michigan Health System, Ann Arbor, MI (Microbiology)

Lab Manager and Liaison: Carol Young

Lab Manager and Liaison: Rosemary Hankerd

UP Health System – Marquette, Marquette, MI

Lab Manager and Liaison: Polly Hockberger, MS, CLS, MT(ASCP)

Wakemed, Raleigh, NC

Lab Manager and Liaison: Lindsay Kimbrell, MLS(ASCP)

### **Histology Programs**

Beaumont Health System, Royal Oak, MI

Lab Manager and Liaison: Jamie Pert, BS, HTL(ASCP)<sup>CM</sup>MB<sup>CM</sup>

Marshfield Clinic, Marshfield, WI

Program Director: Caroline Raycher, HT(ASCP)

## **Mission Statement**

The mission of the Clinical Laboratory Science programs is to educate future clinical laboratory professionals. We seek to engage students in innovative, problem-based learning, preparing them to serve the regional and global community with skill and compassion. The programs strive to provide excellent instruction such that graduates will be highly successful in attaining professional certification, employment, professional development and higher education.

## **Essential Functions Required of The Clinical Laboratory Sciences Programs**

The National Accrediting Agency for Clinical Laboratory Sciences requires essential functions required for program admission to be clearly defined, published, and provided to prospective students and made available to the public. All CLS students, and thereby all applicants, are expected to meet the following requirements.

### **Technical Requirements**

- Perform laboratory manual, semi-automated, and automated procedures in which human biological samples are tested for their biochemical, hematological, microbiological, and immunologic components.
- Be able to discriminate colors and odors in order to identify reagents, select proper tube types, distinguish physical properties of various body fluids and prepare and identify cells and tissues.
- Employ a microscope to identify and describe components of microscopic specimens.
- Read and comprehend text, numbers, and graphs displayed in print and on a computer screen.
- Use a computer keyboard to operate laboratory instruments and to calculate record, evaluate, and transmit laboratory information.
- Possess sufficient vision to easily read charts, graphs, instrument panels, printouts, small graduated scales, etc.

### **Movement Requirements**

- Be sufficiently mobile to traverse about the laboratory, hospital corridors, patient rooms, offices and patient examining rooms, (minimum width approximately three feet).
- Be able to sit for extended periods at computer stations, read information from a monitor and use the keyboard.
- Reach laboratory bench tops and shelves, patients lying in hospital beds or patient seated in specimen collection furniture.
- Perform moderately taxing continuous physical work, often requiring prolonged sitting or standing, over several hours.
- Maneuver phlebotomy and culture acquisition equipment to safely collect valid laboratory specimens from patients.
- Utilize laboratory equipment (e.g. pipettes, inoculating loops, test tubes, automated equipment) and adjust instruments to perform laboratory procedures.
- Demonstrate sufficient manual dexterity to safely and accurately perform required tasks such as phlebotomy, operating delicate instruments, manipulating tools, handling small containers of potentially bio-hazardous specimens (one by one-half inch), and utilizing sample measuring devices.

## **Communication Requirement**

- Be able to read, write and communicate in the English language to facilitate effective communication with patients, physicians, and all other members of the health care team.
- Reading ability sufficient to take paper, computer, and laboratory practical examinations.
- Read and comprehend technical and professional materials (e.g. textbooks, magazines, journal articles, handbooks, and instruction manuals)
- Follow verbal and written instructions in order to correctly and independently perform laboratory test procedures.
- Possess sufficient hearing ability with or without auditory aides to understand the normal speaking voice and discern audible instrument alert signals and timing devices.
- Possess the emotional health and psychological stability required to fully utilize their intellectual abilities under stressful conditions thus allowing them to be able to recognize emergencies, take appropriate action, and be an effective problem solver.
- Effectively instruct patients prior to specimen collection.
- Effectively, confidentially, and sensitively converse with patients regarding laboratory tests.
- Maintain patient confidentiality at all times.
- Use computer software (word processor, spreadsheet, database, information systems), and the internet for communication, education (to include assessments), and professional purposes.
- Independently prepare information papers and prepare laboratory reports. , and
- Interpersonal Skills: Establish rapport with individuals, families, and groups, respect/value cultural difference in others, negotiate interpersonal conflict

## **Intellectual Requirements**

- Possess these intellectual skills; comprehension, measurement, mathematical calculation, reasoning, integration, analysis, comparison, self-expression, and criticism.
- Perform problem solving and employ critical thinking skills effectively.
- Exercise sufficient judgment to recognize and correct performance deviations.
- Critically evaluate own performance, accept constructive criticism, and strive to improve performance.

## **Behavior and Professional Requirements**

- Be honest, compassionate, ethical, responsible, and forthright about errors or uncertainty.
- Dress to project a neat, well-groomed, professional appearance in accordance with established codes.
- Behave in a professional manner toward fellow students, faculty and staff, healthcare professionals, and patients.
- Manage the use of time, prioritize actions, and multi-task in order to complete professional and technical responsibilities under time constraints.
- Possess the emotional health required to fully utilize intellectual abilities under stressful conditions with the ability able to recognize emergency situations, take appropriate action, and be an effective problem solver.
- Provide professional and technical services while experiencing the stresses of task-related uncertainty, emergent demands, and a complex and distracting environment.
- Be flexible, creative and adapt to change.
- Recognize potentially hazardous materials, equipment, and situations and proceed safely in



order to minimize risk of injury to patients, self, and nearby individuals.

- Adapt to working with potentially infectious specimens, a variety of chemicals, and biological agents.
- Support and promote the activities of fellow students and of health care professionals.
- Exhibit integrity, motivation, independence, and leadership.
- Be a constructive member of the healthcare team

NOTE: The student is encouraged to consider the physical and mental requirements of the Program and to make an appointment with the Program Director to discuss concerns or requests for accommodation for his/her disability. Students with documented needs for accommodations are to meet with Northern Michigan University's Dean of Students Office.

## **Expected Student Graduate Outcomes**

1. Meet expected competencies of the individual fields of clinical science as dictated by certifying/professional agencies and expected industry standards.
  - Graduation Rate with Benchmark at 70%
2. Succeed in National Certification Exams such that the Program Pass rate meets or exceeds the national pass rate; that Program meets or exceeds the national means.
  - ASCP Exam Pass Rates with Benchmark at 75%
3. Compete effectively in the job market with an 80% or better placement rate and/or matriculate successfully into an advanced course of study.
  - Graduate Placement Rate with Benchmark at 70%
4. Become professionally involved beyond the minimum day-to-day job requirements of career-entry practice as might be evidenced by; gaining promotions or attaining specialization, membership in associations, participating in committee work, conducting or participating in research, developing a project, making presentations, continuing one's education (CE or formal education), and professional work resulting in publications.

## **External Certification, Graduation Rate, and Placement Rate Outcomes**

CLS outcomes statistics are posted on the CLS website at:

<https://nmu.edu/clinicalsciences/index.php/introduction-clinical-sciences>

## Overall CLS Program Admission and Placement Policies

### Admission Policy

All students wishing to enroll in the first semester of a CLS program may do so, providing they have an adequate background for the courses. Current prerequisites are listed in the course descriptions. A faculty member and/or academic advisor may require the student to complete some remedial work.

### Application for the Clinical Track

#### First Time Applicants:

All students who have completed CLS 100 with a satisfactory grade and CLS 109 or equivalent with a C\* or better are eligible to apply for a clinical training position (refer to the specific major for details). The application must be submitted no later than December 10 and April 10 (Fall and Winter respectively). The application must be accompanied by the Hepatitis B Policy page and Verification of Policies page. Specific criteria that will be taken into consideration for acceptance is listed in each program section of this handbook.

NOTE: All applicants are informed by letter of their admission status.

- a. Students must apply by December 10 and April 10 as described for the first time applicants.
- b. The same criteria as stated for each program will be considered here also. The criteria used to determine clinical placement are impartial and confidential.
- c. Students re-entering the program will meet the requirements and policies of the current curriculum.
- d. Due consideration will be given to repeat applicants when ranking applicants.
- e. If a student has twice been accepted into the program and then withdrawn or become ineligible, his/her future applications may, at the discretion of the program director, require an appeal letter.
- f. The procedures for notification of placement are confidential and only the student is informed via email of the placement decision.

#### Late Applicants/Reactivation Applicants:

Students who have successfully completed CLS 100 but have not applied by the December 10th and April 10th deadline dates may submit a late application for the program. These students:

- a. Must apply through the Clinical Sciences Program Director.
- b. Must meet all the program hospital placement criteria.
- c. Will be considered for placement only if an opening occurs.
- d. In the event of tied rankings, late applicants will be ranked below reactivation applicants for the hospital openings.

### Continuation in the Program

Students must meet certain academic criteria in order to remain in the program and be placed in a clinical site for the final practicum portion of the curriculum. These criteria are specific for each program and can be found in the appropriate program section of this handbook.

If a student fails to meet any of the above criteria, he/she must remove such deficiencies before the scheduled clinical placement period. If this is not possible, the student may reapply for the next practicum class; at which time the student will participate in some remediation activity sanctioned by the School before being accepted.

## **FACULTY RIGHTS**

**The student is continuously reviewed for placement. If at any time the faculty feel it is inadvisable to place the student due to conduct, behavior, academic standing, failure to meet some of the technical standards or anything which would seriously question whether the student would be able to succeed in a practicum, the student will be withheld from placement. The student may also be removed from the practicum for any of the above reasons at any time.**

### Policy for Students Denied Placement

Students are informed of their responsibility to complete an application to the practicum at orientation as well as in CLS courses throughout the year. Placement in a clinical internship is competitive and thus, ultimately one's placement is dependent on their performance. Every effort will be made by the faculty to secure clinical placement for each eligible student. If a student is denied placement based on academic standing or performance, the requisite courses or assignments must be completed to satisfaction before the student can reapply for a clinical internship.

### Service Work Policy

Student's work in each rotation shall be signed/co-signed by the appropriate bench tech. Students shall not be used as substitutes for employees (i.e. the laboratory staffing plan must not rely upon student work). Upon completion of a rotation or specific competencies, students may perform service work for compensation (above and beyond training hours required by the program) as dictated by laboratory policy. Students may not be required to perform service work by the affiliate.

**\*A C- or better for all students with a bulletin prior to Fall 2016**

## **Non-Affiliated Clinical Sites Policy Statement**

Students are welcomed to pursue placement at non-affiliated hospitals/clinics.

The student should first contact the lab manager to determine if the lab is willing to provide them a practicum (the student should provide the lab manager the practicum dates). If the lab manager agrees, the student should then notify the CLS program director. The program director will assess whether the lab meets practicum requirements, and if the lab is approved, NMU will then establish an affiliation agreement with the hospital/clinic (if an agreement doesn't already exist). Once the affiliation agreement is established, the student will then be required to complete all onboarding requirements required by the hospital/clinic.

We do not want students to rescind already established agreements. For that reason:

- If a student plans to pursue a non-affiliated site, they must not already be placed a practicum site.
- If a student is in the process of securing a practicum at a non-affiliated site (the process described below), they will not be included in the standard placement process. We want to avoid students establishing plans with lab managers, but then choosing a different option.

Regarding international possibilities, criteria for consideration include the following:

- The country being considered and the quality of clinical experiences in that country
- The training site capabilities
- Student selection: Such as GPA, international experience and other relevant factors (i.e.: minor in international studies, existing support group in the area, etc.)

Martin Renaldi  
Program Director  
Clinical Sciences Program

## **Poor Performance Policy for Laboratory Based Majors (CLS, CLT)**

**Students must earn a grade of C\* or better in all CLS courses as well as maintain a minimum 2.0 NMU cumulative GPA.**

### **Poor Performance Warning:**

If a student with a CLS major earns less than a C\* in one or more CLS courses in one semester, they will be issued a poor performance warning letter.

### **Poor Performance Dismissal:**

A student can repeat a course with a CLS prefix only once. If a student with a CLS major earns less than a C\* in their second attempt, he/she will not be allowed to continue in the program unless an appeal is granted by the program director. The appeal process is described below.

### **Faculty Rights:**

The faculty reserve the right to remove any student from the program whose conduct, behavior, scholastic standing, or clinical practice is such that it is inadvisable for the student to remain in the program.

### **Clinical Practicum Policy:**

A student may not receive a grade of "U" or less than a C\* in any of the practicum courses. If a student does receive a grade of "U" or less than a C\* the student will be removed from the clinical practicum with the following consequences:

1. He/she will not be able to graduate with the degree.
2. The student will not be qualified to take the national certification exam.
3. The student will not be recommended to any other hospital affiliate.

Sometimes extenuating circumstances (birth of a baby, serious illness or accident, death in the immediate family) will result in a poor grade. The faculty will take this into account and one of the following actions may be taken:

1. The student may be removed from the clinical practicum (as stated above)
2. Arrangements may be made with the clinical facility to repeat the failed section in the next placement if an opening is available
3. The student's name may be put on a waiting list for the next clinical practicum.

If the student has not successfully (as described above) completed the practicum or any aspect of the total program prior to a national certification exam, Program Director confirmation of examination eligibility will be withheld until successful completion of any deficiencies.

### **Appeal Process:**

The student may make appeals to the Program Director. Appeals must be written and should explain extenuating circumstances or mitigating factors. The Program Director with relevant consultation will consider all appeals.

**\*A C- or better for all students with a bulletin prior to Fall 2016**

## **Warning or Academic Probation, Dismissal, and Appeals**

School of Clinical Sciences students must maintain academic good standing. University policies for probation, suspensions, dismissal, and appeals can be reviewed here: <https://nmu.edu/acac/academicprobation>

## **Advanced Placement Credits Via Experience**

The School of Clinical Sciences recognizes the value of experiential learning. These learning experiences may have advanced the student in any of the three objective domains: cognitive, psychomotor and affective. Therefore, the department's policy is as follows:

### **The School of Clinical Sciences:**

Accepts and applies, as appropriate, the NMU Advanced Placement Policy:  
<https://nmu.edu/bulletin/advanced-placement-policy>

### **Sophomore Practicum Advanced Placement**

Students who are already MLT(ASCP) certified are automatically granted credit for all Freshmen and Sophomore clinical laboratory sciences courses.

### **Senior Practicum Advanced Placement: Medical Laboratory Science or Microbiology Concentration**

In order to be eligible for consideration for advance placement credit in all or part of the 20 week senior practicum, the following conditions must be met:

- MLT certification
- At the time of graduation, the student must have at least two (2) years full time medical laboratory technician experience\* (in the last 4 years) in an accredited clinical laboratory\*\*, offering the majority of routine testing in all areas of the lab. The applicant must have worked at the MLT level or higher in all major departments of the laboratory performing 80% of routine testing. Documentation of this experience is required; the applicant's former/current supervisor must submit an attestation form that checks off the P.O.'s from the senior practicum.

\*Full time experience is defined as a minimum of thirty-five (35) hours per week. Individuals who have part-time experience may be permitted to utilize prorated part-time experience to meet the work experience requirements. For example, if you are employed 20 hours per week for one year, your experience would be computed as 20 divided by 35 multiplied by 52 weeks, or the equivalent of 29.7 weeks of full-time employment.

\*\*CMS CLIA certificate of registration, compliance, accreditation; OR TJC accreditation; OR CAP Accreditation; OR COLA Accreditation; OR Accreditation under ISO 15189



## **Resident Status, Liability, and Health Insurance**

### **Resident Status**

Students registered in a practicum are considered full time resident students. Students need not have their I.D.'s validated unless they want to use NMU facilities (library, etc.). All students are eligible for student health services.

### **Liability Insurance**

All students have liability insurance coverage (NMU) while training in external agencies for various practicums. However, students are not covered with insurance if and while they are working for the clinical site for pay.

### **Health Insurance**

Health insurance is a necessity. As a student, you should make sure that you are covered under a health insurance policy -- either your parent's, spouse's, place of employment, or your own. If you do not have a health insurance policy - **BUY ONE**. The University offers a policy to students at reasonable rates. Budget health insurance into your education plans, just as you do tuition

## Clinical Sciences Awards

### Outstanding Graduating Senior Award (awarded every Spring)

**Purpose:** To honor the senior student with the highest GPA and with the greatest accomplishments or professional growth.

**Eligibility:**

- Graduating senior, immediate past December/August or current May and graduation with a B.S. degree.
- Graduate with a 3.0 GPA or higher.
- Received positive evaluations in the practicum (where applicable) or laboratory experience if a practicum is not required.

**Process:** This award is based primarily on GPA with other factors considered when more than one candidate has a similar GPA. A meeting of the department faculty will determine the final choice. There is only one selection/year.

**Presentation:** Presented at the Spring Honors Banquet and in May of each academic year. The student will have their name inscribed on a departmental plaque. The student will receive an individual certificate plaque.

### Outstanding Student Practitioner Award (awarded each semester)

**Purpose:** To recognize the student who has excelled in the clinical training component of the curriculum, placing particular emphasis on volunteerism and professionalism.

**Eligibility:** Must be enrolled in a practicum, which is part of a university-based curriculum.

**Process:** Nominations are accepted from the appropriate clinical agencies. The nominations speak to the following traits: ambassadorship, service, initiative, team leader, disposition, and ability to accept criticism/direction. The final selection will be made by the School of Clinical Sciences. One selection from each level practicum may be made each semester.

**Presentation:** The student's name will be inscribed on a School plaque. The student will receive an individual certificate-plaque.

### Outstanding Associates Degree Graduate in Clinical Lab Sciences (awarded every December)

**Purpose:** To recognize the most outstanding graduate of the Associates degree program based on GPA and with the greatest accomplishments or professional growth.

**Eligibility:**

- A graduating Associates degree student for the calendar year.
- Graduate with a 2.75 GPA or higher.
- Received positive evaluations in the practicum.

**Process:** This award is based primarily on GPA with other factors considered when more than one candidate has a similar GPA. A meeting of the department faculty will determine the final choice. There is only 1 selection/year.

**Presentation:** Presented in December of each calendar year. The student will have their name inscribed on a School plaque. The student will receive an individual certificate-plaque.

### **Outstanding Global Campus Student (awarded every Spring)**

**Purpose:** To honor the senior global campus student with the highest GPA and with the greatest accomplishments or professional growth.

**Eligibility:**

- Graduating senior, immediate past December/August or current May and graduation with a B.S. degree.
- Graduate with a 3.0 GPA or higher.
- Received positive evaluations in the practicum (where applicable) or laboratory experience if a practicum is not required.

**Process:** This award is based primarily on GPA with other factors considered when more than one candidate has a similar GPA. A meeting of the department faculty will determine the final choice. There is only one selection/year.

**Presentation:** The student will have their name inscribed on a departmental plaque. The student will receive an individual certificate plaque.

### **Outstanding Graduating Graduate Student Award (awarded every Spring)**

**Purpose:** To honor the graduating graduate student with the highest GPA and with the greatest accomplishments or professional growth.

**Eligibility:**

- Graduating graduate student, immediate past December/August or current May and graduation with a B.S. degree.
- Graduate with a 3.0 GPA or higher.
- Received positive evaluations in the practicum (where applicable) or laboratory experience if a practicum is not required.

**Process:** This award is based primarily on GPA with other factors considered when more than one candidate has a similar GPA. A meeting of the department faculty will determine the final choice. There is only one selection/year.

**Presentation:** The student will receive an individual certificate plaque.

## Professional Appearance

Your professional appearance begins now. You have decided to pursue a career in laboratory medicine in which you will either be working with patients, clinicians, scientists, technologists, administration, and/or the public in general. Consequently, your appearance in these situations is very important. So important, that all of the clinical settings in which you may intern or practice have specific regulations regarding appearance. Although these policies vary somewhat, the School has developed a code that is fairly comprehensive and reflective of the typical policies found in the clinical settings. The School believes it is important to model a professional appearance while pursuing your degree. Although it is only encouraged at the beginning, **it is a requirement when placed in a clinical setting for your practicum.**

1. Visible body piercing jewelry may be worn only on the ears and up to 2 per ear. Other bodily piercing jewelry that is normally visible must be removed while in the practicum. It is insufficient to cover up such jewelry.
2. No artificial fingernails (wraps, acrylics, tips, tapes, and nail piercing jewelry of any kind) and natural fingernails  $\frac{1}{4}$  inch past the tip of the nail (as these have been shown to harbor microorganisms) for all students who have direct patient contact or contact with patient supplies, equipment, or food. No nail polish.
3. No open-toed shoes may be worn in the clinical site. Athletic shoes may be acceptable, but they must be clean and not scuffed.
4. Long hair must be pulled away from the face.
5. No long scarves or long necklaces.
6. No excessive jewelry. Only rings on the traditional ring fingers. If they are big and cause a problem with latex gloves, do not wear them to the clinical setting.
7. No cargo pants or jeans. Shirts or blouses with a collar are preferred; however if a shirt without a collar is worn it must not have a low cut. Boat-necks, turtlenecks, crew-necks or high V-necks are acceptable.
8. Use good judgment for hair color; nothing brash or unnatural looking (such as blue, pink, green, orange, red etc.)
9. Personal hygiene must include deodorant, mild (or no) cologne scent, and daily showering. Smoker's breath or body odor is not tolerated.
10. Make-up must be conservative or relatively subtle in application.

## Professional Behaviors

1. Absolutely no foul language at any time! Learn how to use mild terms such as darn, drat, heck, oops, crumps, oh no, sugar, shucks, gosh, phooey etc. Anything stronger is inappropriate!
2. Please, excuse me, yes (not yeah), would you repeat that, I'm sorry, I made a mistake, how can I help, I'll check that out for you, thank you, etc. are all signs of respecting your colleagues and work environment.
3. Loud laughing or talking is distracting and inappropriate. Keep it to the break room or just tone it down.
4. Refrain from gossip.
5. Uphold confidentiality, always.
6. Demonstrate behaviors that convince your supervisors that you work well in a team and can work independently. This includes your ability to resolve conflict in a professional and respectful manner.

## **ASCLS Code of Ethics**

### **Preamble**

The Code of Ethics of the American Society for Clinical Laboratory Science (ASCLS) sets forth the principles and standards by which clinical laboratory professionals practice their profession.

### **II. Duty to the Patient**

Clinical laboratory professionals are accountable for the quality and integrity of the laboratory services they provide. This obligation includes maintaining individual competence in judgment and performance and striving to safeguard the patient from incompetent or illegal practice by others.

Clinical laboratory professionals maintain high standards of practice. They exercise sound judgment in establishing, performing and evaluating laboratory testing.

Clinical laboratory professionals maintain strict confidentiality of patient information and test results. They safeguard the dignity and privacy of patients and provide accurate information to other health care professionals about the services they provide.

### **III. Duty to Colleagues and the Profession**

Clinical laboratory professionals uphold and maintain the dignity and respect of our profession and strive to maintain a reputation of honesty, integrity and reliability. They contribute to the advancement of the profession by improving 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.

Clinical laboratory professionals actively strive to establish cooperative and respectful working relationships with other health care professionals with the primary objective of ensuring a high standard of care for the patients they serve.

### **IV. Duty to Society**

As practitioners of an autonomous profession, clinical laboratory professionals have the responsibility to contribute from their sphere of professional competence to the general wellbeing of the community.

Clinical laboratory professionals comply with relevant laws and regulations pertaining to the practice of clinical laboratory science and actively seek, within the dictates of their consciences, to change those which do not meet the high standards of care and practice to which the profession is committed.

## **Pledge to the Profession**

**As a clinical laboratory professional, I strive to:**

- Maintain and promote standards of excellence in performing and advancing the art and science of my profession.
- Preserve the dignity and privacy of others.
- Uphold and maintain the dignity and respect of our profession.
- Seek to establish cooperative and respectful working relationships with other health professionals.
- Contribute to the general wellbeing of the community.

I will actively demonstrate my commitment to these responsibilities throughout my professional life.

# Clinical Laboratory Sciences Curriculum and Policies



## **Clinical Laboratory Sciences Course Descriptions and Credit Hours**

Course descriptions and credit hours for CLS undergraduate and graduate courses can be reviewed on the NMU Bulletin:

[https://nmu.edu/bulletin/courses?q=courses&field\\_department\\_target\\_id=&field\\_prefix\\_value=CLS&field\\_number\\_value\\_1=1&field\\_number\\_value=&field\\_credits\\_low\\_decimal\\_value=&title=&combine=&field\\_edition\\_target\\_id=17&page=0](https://nmu.edu/bulletin/courses?q=courses&field_department_target_id=&field_prefix_value=CLS&field_number_value_1=1&field_number_value=&field_credits_low_decimal_value=&title=&combine=&field_edition_target_id=17&page=0)

## **Clinical Laboratory Technician**

The clinical laboratory technician performs clinical laboratory tests on a variety of body fluids under supervision, for the purpose of providing data which may be used to determine the presence and extent of disease as well as to ascertain the cause of disease. The clinical laboratory technician must be able to function in all areas of the clinical laboratory (the major departments being hematology, microbiology, blood banking, and clinical chemistry), performing about 80% of all assays, operating a variety of sophisticated instruments, solving technical problems, reviewing and evaluating data, communicating with patients and health care professionals and using information systems.

A clinical laboratory technician or medical laboratory technician usually works under the supervision of a clinical laboratory scientist. The CLT/MLT is responsible for performing laboratory tests efficiently and accurately for high-quality patient care.

### Employment Opportunities

Opportunities for clinical laboratory technicians include hospitals, independent laboratories, clinics, public health facilities, and industry.

### Professional Requirements

An Associate Degree from an accredited institution including supervised clinical experience in an approved laboratory practicum; plus successful completion of a national certification examination such as that offered by the ASCP.

General education courses combined with the Clinical Laboratory Technician courses comprise the first three semesters on campus. The final 6 months are spent in a full-time clinical practicum at an affiliated hospital. Placement into the hospital is based upon established criteria. The student capacity for each hospital is limited; therefore placement into the practicum is limited. Applications for admission into the practicum are accepted upon successful completion of CLS 100, CLS 109 and 190 or 200. Upon completion of all degree requirements, the graduate is eligible to take the national examination for certification as a Medical Laboratory Technician under the American Society of Clinical Pathologists (ASCP).

## **Clinical Laboratory Technician Goals and Competencies**

To prepare technically competent graduates supported by a comprehensive knowledge base to work independently in a full-service clinical laboratory with minimal supervision.

### Goals

Enable the student to:

1. Attain proficiency in laboratory skills and techniques representing all areas of the clinical laboratory.
2. Reinforce the student's theoretical understanding of laboratory procedures and analytical significance.
3. Expand on their body of knowledge related to clinical laboratory science.
4. Understand their role and responsibilities on the health care team regarding communication, data evaluation and management, QA and patient outcomes.
5. Secure positive recommendations from the clinical site.

### Competencies

At career entry the Clinical Laboratory Technician will be able to:

1. Perform routine procedures employing common techniques used in the clinical laboratory. This also includes preparing /selecting necessary reagents, controls and instruments used for the procedure.
2. Define and/or identify:
  - a. principles of clinical laboratory procedures
  - b. fundamental biological characteristics as they pertain to laboratory testing sources of error in laboratory testing
  - c. fundamental characteristics of laboratory operations
3. Calculate results from supplied and/or obtained data.
4. Correlate and analyze laboratory findings, clinical data, quality control data and other lab data to assess test results and procedures.
5. Analyze and/or evaluate laboratory findings to:
  - a. recognize common problems and errors
  - b. take corrective action according to predetermined criteria recognize and report the need for additional testing.
6. Demonstrate a competent knowledge base as defined by the professional organization.

Essential Functions: As described in the essential functions section.

## **Clinical Laboratory Technician Performance Criteria**

### Specific CLT Criteria for Application:

1. Performance in CLS 100 (S) & CLS 109, 190 or 200 (C\* or better) and other required science courses.
2. Minimum Grade Point Average = 2.0
3. Subjective assessment of student aptitude and attitude by CLS faculty.
4. Completion of application form which includes:
  - a. hepatitis B vaccine statement
  - b. signature page attesting to the ability to meet the essential functions of the program (verification of policies)
5. If accepted for a clinical placement, students will be required to upload their immunizations and health insurance information as well as complete a criminal background check prior to clinical training. Students may also be required to complete a drug screening and/or fingerprinting prior to clinical training. Students demonstrating a positive background check and/or fingerprinting may be denied admission to the health professions program. Students demonstrating a positive drug test will be denied placement; however, they may have their application reconsidered for future admission to the health professions program if clinical placement opportunities are available. Students demonstrating a positive background check or drug test while enrolled in health profession programs will be dismissed from the program.

### Continuation in the Program/Practicum Placement:

Students must meet certain academic criteria in order to remain in the program and be placed in a clinical site for the final practicum portion of the curriculum. These criteria are:

1. Grade of C\* or better in all CLS courses required for the curriculum (Grade of satisfactory in CLS 100).
2. NMU/cumulative GPA of at least 2.0 and a CLS GPA of at least 2.0.
3. Receive a positive or satisfactory rating in the laboratory component of each required CLS course.
4. Favorable subjective assessment of attitude and aptitude by CLS faculty.
5. Completion of all required courses prior to sophomore practicum.

### Criteria for CLT Associate Degree:

1. In order to be granted an associate degree in CLT a student must have at least a 2.0 GPA, received no less than a C\* in any of the required clinical laboratory science courses and maintained at least a 2.0 GPA in the major and earned 63 credits in courses from the Bulletin under CLT curriculum.
2. Granting of the degree is not contingent on passing the national CLT certifying exams.
3. Transcripts of transfer students from another major or institution will be reviewed individually for compliance with these criteria, prior to hospital placement.
4. Students must pass the CLT Program comprehensive exam prior to graduation. After two failed attempts, the student must take a 2-credit CLS directed study to be eligible to re- take the comprehensive exam. As part of each directed study, a student may take the comprehensive exam only twice. If the student fails both attempts, an additional 2 credit directed study is required. There is no limit on the number of directed study attempts.

**\*A C- or better for all students with a bulletin prior to Fall 2016.**

## **Clinical Laboratory Technician Sophomore Practicum Placement Procedures**

All students in CLS 109 interested in continuing in the CLT/CLS program will be asked to complete a practicum application. The CLT/CLS Admissions Committee will select students to fill the available practicum positions.\* For those students selected, a clinical training site will be reserved providing they continue to meet academic, technical, and affective performance criteria.

In the semester before placement into the practicum, the faculty will finalize student placements. PLACEMENT IS NOT GUARANTEED AS THE PROGRAM IS LIMITED TO THE HOSPITAL CAPACITY AT ANY GIVEN TIME. If the number of qualified applicants exceeds the number of clinical placements, the students not placed will be put on a waiting list. Should an opening occur, the student at the top of the waiting list (see criteria for ranking applicants) will be offered the clinical placement. If no openings occur, the students on the waiting list will be considered with the next group of applicants.

The student is encouraged to make their hospital preferences known to the Director prior to the final decision. Once the hospital assignments have been made, they are final. CLS 250T, CLS 244, and CLS 251-253 are the courses in which the students will register for their laboratory training in the hospital.

Two weeks prior to the sophomore practicum the students should contact the teaching supervisor of the hospital to which they have been assigned. This will give the supervisor an opportunity to ask any last-minute questions or outline any final preparations to be completed before the practicum begins.

### **\*Summary Assessment by CLS Faculty**

(Used in the deliberation for clinical placement)

The CLS faculty will meet at the end of each semester and assess the technical competence and professional behaviors of each CLT or CLS student. Should an area of concern be raised, the student will be notified, otherwise a copy of this assessment will be placed in the student file. After two semesters (or one semester away from actual placement) the student will be notified if the assessment indicates that it is questionable as to whether the student will be recommended for clinical placement. If the student continues in the next semester with hopes of doing better it will be at the students own risk.

The following factors considered in the assessment:

1. Technical Progress (i.e. improvement in productivity and skill level)
2. Promptness, punctuality, attendance
3. Positive attitude, enthusiasm
4. Controls emotions
5. Cooperation
  - Works well with other students
  - Works well with faculty
  - Exhibits tact
  - Helpful in lab
6. Good communication skills
7. Preparedness

### **Student Capacity/Waiting List:**

Students are not guaranteed clinical placement. Placement into a clinical affiliation (hospital site) is limited by the number of affiliates and each affiliate's student capacity. See the Clinical Affiliation Information Grid for affiliates and student capacity in this manual. If the number of qualified students exceeds the number of clinical places, those students not placed will be put on a waiting list. Should a cancellation occur, the student on the top of the waiting list (see Criteria for Ranking) will be offered the clinical placement. If no cancellations occur, those students on the waiting list may reapply with the next group of applicants.

### **Advanced Placement:**

Students with clinical laboratory experience may be given advanced placement credit for the sophomore and/or senior practicum or partial credit for either. Placement for senior practicum requires MLT certification. Experience must be documented. The Clinical Sciences faculty will use ASCP technical curricula criteria as the basis for evaluating the documentation and making final determinations for the extent of advance placement.

### **Seven Years Dated Transcript:**

Students who have completed formal clinical laboratory sciences courses seven years before application will need to have their transcripts evaluated by the School of Clinical Sciences (after the transcript evaluation office). Students may need to re-take the CLS courses depending on recent experience, continuing education, etc.

### **Foreign Degrees:**

Students who wish to become Clinical Laboratory Scientists and already possess a foreign degree must have their transcript evaluated by the University Transcript Evaluation Office and the CLS faculty. Once evaluated and documented, the student must meet with the CLS adviser to finalize a schedule of courses.

## Criteria for Ranking Clinical Laboratory Technician Practicum Applicants

The following items and conditions can be used in determining student internship placement. Placement is competitive. In addition, affiliate needs as well as student success will be considered when determining placement. Students should inform faculty if any of these situations are in effect when they submit their practicum application. The following factors are considered in the rank order that they are listed. If two students desire the same clinical slot the following factors will be considered:

1. The student with the highest GPA points (max 4 points) will be given preference. The point formula is outlined below:

- a. GPA

(Must be 2.0 to  
be eligible)

$$2.0 - 2.49 = 0.25$$

$$2.5 - 2.99 = 0.50$$

$$3.0 - 3.49 = 0.75$$

$$3.5 - 4.0 = 1$$

- b. CLS GPA

Same

- c. Science GPA

(Physics, Chemistry, Biology)

Same

- d. Quantity of additional Science courses (do not include any with W, I or F) =

$$<1 = 0$$

$$1-2 = 0.25$$

$$3-4 = 0.50$$

$$5-6 = 0.75$$

$$7 = 1$$

2. Whether the student has young children, if so they will be given preference.
3. Students who are married (not engaged) will be given preference.
4. Extenuating circumstances will be considered.



**CLINICAL LABORATORY TECHNICIAN**  
(Associate Degree)

SEMESTER 1 (Fall).....		15-16
*CH 111	General Chemistry I (F,W,S: Math Prerequisite) .....	5
<b>OR</b> *CH 105	Chemical Principles (F,W: Math Prerequisite).....	4
BI 104	Human Anatomy and Physiology (F,W) .....	
<b>OR</b> BI 207	Human Anatomy and Physiology (F,W: CH 105, 109, or 111—CH can be taken concurrently). .....	4
CLS 100	Obtaining a Blood Specimen (F,W) .....	1
CLS 109	Intro to Diagnostic Sciences (F,W) .....	1
CLS 190	Microscopy & Lab Techniques (F) or CLS 200 (W) .....	1
MA 111	College Algebra (F,W,S).....	4
SEMESTER 2 (Winter).....		16-17
*CH 112	General Chemistry (W,S: CH 111) .....	5
<b>OR</b> *CH 109	Organic & Biochemistry (F,W: CH 105).....	4
EN 111	College Composition I (F,W,S) .....	4
CLS 201	Clinical Hematology/Coagulation (W: CLS 109, CLS 190, BI 104 (can be taken concurrently) or IP).....	3
CLS 203	Immunohematology (W: CLS 213 or concurrent enrollment) .....	3
CLS 200	Urine and Body Fluid Analysis (W).....	1
CLS 213	Clinical Immunology & Serology (W) .....	1
SEMESTER 3 (Fall).....		16-17
**General Electives.....		3-4
EN 211	College Composition II (F,W,S: EN 111).....	4
CLS 202	Clinical Chemistry (F).....	4
CLS 204	Clinical Microbiology (F: CLS 109, BI 104, or IP).....	2
CLS 214	Diagnostic Microbiology (F: CLS 204 or concurrent enrollment or IP). .....	3
SEMESTER 4 (Fall & Winter) .....		12
(Sophomore Practicum)		
CLS 251	Clinical Hematology Practicum .....	3
CLS 252	Clinical Chemistry Practicum.....	4
CLS 253	Blood Banking Practicum .....	3
CLS 250T	Clinical Practice .....	2
SUMMER SESSION .....		4
CLS 244	Clinical Microbiology and Blood Bank Simulation Lab ..	4
TOTAL CREDITS REQUIRED FOR GRADUATION.....		60-62

\*Any sequence of chemistry above 100 level for 8 credits. If pursuing MLS degree, CH 111 and 112 are recommended

\*\*Recommend BI 111 if pursuing MLS degree





**Medical Diagnostics  
(Associate Degree)**

SEMESTER 1 (Fall).....		16
CLS 100	Obtaining a Blood Specimen (F,W) .....	1
CLS 109	Intro to Diagnostic Sciences (F,W) .....	1
CLS 190	Microscopy & Lab Techniques (F) .....	1
BI 207	Human Anatomy & Physiology 1 (F,W).....	4
CH 111	General Chemistry I (F,W,S:MA 111 or C- or higher in MA 100)	5
EN 111	College Composition I (F,W,S) .....	4
SEMESTER 2 (Winter).....		17
BI 208	Human Anat & Phys 2 (F,W: CH 105, CH 107 or CH 111) .....	4
CH 112	General Chemistry (F,W,S: C- or higher in CH 111) .....	5
EN 211	College Composition II (F,W,S: EN 111) .....	4
MA 111	College Algebra (or above) (F,W,S: C- or higher in MA 100).....	4
SEMESTER 3 (Fall).....		15
CLS 202	Clinical Chemistry (F) .....	4
CLS 204	Clinical Microbiology (F: CLS 109, or BI 104) .....	2
BI 111	Intro to Biology: Principles (F,W).....	4
CH 220 <b>OR</b>	Introduction to Organic Chemistry (F: CH 111/112) <b>OR</b>	
PH 201	Physics (F,W,S: if lower level chemistry taken) .....	5
SEMESTER 4 (Winter) .....		16
CLS 200	Urine and Body Fluid Analysis (W) .....	1
CLS 201	Clin Hematology/Coag (W: CLS109,190, BI 104) .....	3
CLS 203	Immunohematology (W) .....	3
CLS 213	Clinical Immunology & Serology (W) .....	1
BI 218	Cell & Molecular Bio (F,W:BI 111,CH 105 or CH 111/112) .....	4
SOCR	Social Responsibility in a Diverse World.....	4
TOTAL CREDITS REQUIRED FOR DEGREE.....		64

# Clinical Laboratory Science

## B.S. Degree Programs

Clinical Laboratory Science is a profession within the broader field of laboratory medicine. The student is directed to read the description of each of the majors [elsewhere in the manual] to better understand the varied and unique responsibilities of those professionals within the field of laboratory medicine that we train. All areas encompass a wide variety of diagnostic and screening assays to generate data and information essential to the diagnosis and treatment of disease and maintenance of health. These analyses must be accurate, precise, and reliable. Professionals often work with state-of-the-art technology and employ a myriad of laboratory techniques.

In order to function in this environment graduates must have sufficient knowledge in biology, chemistry, lab medicine, quality assurance programs and be technically competent, efficient, and productive. These attributes are not only essential for clinical laboratory professions, but can also be applied to many other institutional setting professions such as:

- Higher education (Physician Assistant, Medical School, Pathologist Assistant, Dentistry, PhD programs)
- Research
- Industry/biotech/commercial diagnostic labs Forensic labs
- Physician office laboratories
- Government reference lab

### Goals

1. Expand technical skills in areas primarily considered special testing.
2. Further develop troubleshooting ability with instruments and testing methods.
3. Further develop problem-solving skills and communication skills through projects such as; method evaluation, presentations, and actual case/problem analysis.
4. Develop the ability to correlate, manipulate and manage data effectively.
5. Expand on their body of knowledge related to clinical laboratory sciences.
6. Become aware of current issues which impact the profession.
7. Enhance understanding of their role and responsibilities in the health care team.
8. Graduate with a personally and professionally rewarding clinical experience.
9. Acquire supervisory skills through mentoring activities and committee involvement.

### Competencies

1. Perform routine procedures employing common techniques used in the clinical laboratory. This also includes preparing /selecting necessary reagents, controls and instruments used for the procedure.
2. Define and/or identify:
  - a. principles of clinical laboratory procedures
  - b. fundamental biological characteristics as they pertain to laboratory testing sources of error in laboratory testing
  - c. fundamental characteristics of laboratory operations
3. Calculate results from supplied and/or obtained data.
4. Correlate and analyze laboratory findings, clinical data, quality control data and other lab data to assess test results and procedures.

5. Analyze and/or evaluate laboratory findings to:
  - a. recognize common problems and errors
  - b. take corrective action according to predetermined criteria recognize and report the need for additional testing.
6. Demonstrate a competent knowledge base as defined by the professional organization.

## **The Clinical Laboratory Science Major**

The School of Clinical Sciences offers six possible concentrations which all pertain to laboratory science. These concentrations are:

- Medical Laboratory Science (aka generalist)  
Microbiology
- Clinical Systems Analyst
- Medical Diagnostics – 2 tracks: CLT Certification or Biotechnology

The goal for each of our programs is to prepare professionals by giving them a comprehensive knowledge base and advanced technical competency to meet ever changing work-place challenges, function independently and work effectively in a team in a laboratory setting. With the exception of the Clinical Systems Analyst and Medical Diagnostics concentrations, all concentrations require an advanced practicum experience.

More information on the different concentrations is found below.

### **Concentration: Medical Laboratory Science**

This major prepares graduates to perform a variety of laboratory assays on human and other types of specimens in clinical, research, commercial (biotechnology, pharmaceutical, etc.) and forensic laboratories to provide diagnostic information necessary to support health care, ensure quality control, facilitate product development and solve problems.

The program incorporates didactic and clinical education throughout the four-year curriculum. Students gain marketable skills after two years in the program through MLT certification. Upon completion of the degree, students are eligible to take the national certification tests: MLS(ASCP). The sophomore and senior practicum components provide an opportunity for students to experience two different clinical settings prior to graduation.

### **Concentration: Microbiology**

Students with this concentration will earn their MLT certification and then will be eligible for national Microbiology Categorical Certification. Graduates traditionally serve in microbiology labs in hospitals and clinics as well as in research and industrial laboratories.

### **Concentration: Medical Laboratory Science or Microbiology**

The goal of the program is to prepare a professional with a comprehensive knowledge base and advanced technical competency to meet the ever changing work-place challenges, function independently and work effectively in a team.

### **Medical Laboratory Science or Microbiology Competencies**

At career entry, the Medical Laboratory Scientist will be able to:

1. Perform routine skills and tasks expected of a MLT graduate at career entry (as described in the CLT/MLT Competency list).
2. Define and/or identify principles of selected special laboratory procedures in all departments.
3. Perform and evaluate proper QA procedures including statistical analyses.
4. Analyze and/or evaluate all laboratory findings to:
  - verify patient results and QA for a given test
  - correlate with health and disease states
  - prescribe course of action for discrepancies
  - recognize possible inconsistent results
  - develop algorithms
5. Apply acceptable principles of teaching and learning to the special needs of education in the clinical laboratory.
6. Identify and apply basic principles of management in regards to planning, organizing, leading and controlling.
7. Assure laboratory safety.
8. Appraise instrumentation/methodology for suitability of analyses.
9. Demonstrate an understanding of current issues facing the profession.
10. Demonstrate an understanding of their role and responsibilities as a member of the health care team.
11. Compete effectively in the job market.
12. Demonstrate adequate knowledge base as defined by the professional organization.

Essential functions: As described in the essential functions section.

### **Concentration: Anatomic Pathology**

Students in this concentration will earn clinical certification as a histotechnologist. Graduates work closely with pathologists in anatomic pathology departments of hospitals or clinics.

Histotechnologists prepare body tissue for examination by a pathologist to diagnose body dysfunction and malignancy and identify tissue structures, cell component and staining characteristics, relate these to physiologic functions, implement and evaluate new techniques and procedures, make quality control judgments and apply principles of management and education methodology when appropriate. The first three years of the curriculum are at the university; the fourth year is completed through an accredited histotechnology practicum off campus. The university is affiliated with hospitals in Wisconsin and Michigan; however, students may apply to any accredited school in the United States. If students meet the hospitals' standards and are accepted, they register for the histotechnology practicum courses at NMU and pursue a twelve-month full time program under the direction of the hospital. If the student meets the hospital's standards and is accepted, then the student registers for NMU practicum courses at and continues to pay regular fees while attending the 12-month program under the direction of the hospital. Generally the hospital program also assesses a tuition fee above and beyond tuition paid at NMU. Upon completion of the 4-year curriculum, students receive the degree of Bachelor of Science from NMU. Goals for anatomic pathology concentration students are:

1. To attain competencies in Histotechnology suitable for passing national certification exams and to secure employment by completing a course of study in cytotechnology or histotechnology at an accredited hospital site.
2. Demonstrate an understanding of their role and responsibilities as a member of the health care team.

3. Successful placement in a hospital-based accredited histotechnology program.

### **Concentration: Clinical Systems Analyst**

This program certifies students at the MLT level and then allows them to proceed through courses focusing on information systems. This concentration is useful since many in the hospital lab find themselves with the desire to be more involved with the laboratory's information system (a vital and surprisingly complex component of the clinical lab). There is a pressing need nationwide for skilled computer information systems graduates who understand the unique requirements of a clinical laboratory. The goal of this concentration is to prepare graduates to work in a clinical laboratory setting, hospital information system department, or with computer vendor companies to address the networking and information management needs of the clinical laboratory.

Clinical System Analyst professionals should be able to:

1. Perform all routine laboratory procedures according to current established practice guidelines.
2. Analyze, evaluate, and correlate clinical data and report appropriately.
3. Design, use and implement software for laboratory information systems using current technologies.
4. Develop working relational database systems.
5. Implement an industrial strength workstation that will administer a small or large network.

### **Concentration: Medical Diagnostics**

This concentration is a good choice for pre-medicine or pre-physician assistant students. The program provides students with a strong foundation in laboratory medicine, a major discipline within internal medicine, and enough general electives to select the additional courses required for graduate school. Students interested in graduate education may choose additional courses in organic chemistry, biochemistry, physical chemistry, physics, genetics as needed for specific programs.

There are two tracks that offer different options for students in this concentration: CLT/MLT Certification track and Biotechnology.

## **Clinical Laboratory Science Performance Criteria**

Admission Policy: Refer to the Overall Program Admission Policies

### Continuation in the Program:

Students must meet certain academic criteria in order to remain in the program. These criteria are:

1. A grade of C\* or better in all CLS courses. (Grade of S in CLS 100)
2. An overall GPA of 2.6 or higher.
3. Receive a positive or satisfactory rating in the labs of each required CLS course.
4. Favorable subjective assessment of attitude and aptitude by CLS faculty.

### For Concentrations Requiring a Senior Practicum: (Medical Laboratory Science, Microbiology)

Due date for the Fall practicum application is December 10

Due date for the Winter practicum application is April 10

After the sophomore practicum, students wishing to pursue a Clinical Laboratory Science degree that requires a practicum must apply for the practicum. The following criteria will be taken into consideration for the final selection.

1. No less than C\* in any CLS course.
2. Satisfactory performance in the previous practicum experience.
3. A minimum NMU/cumulative GPA of 2.6.
4. A subjective assessment of student aptitude and attitude by CLS faculty.
5. Favorable confidential recommendations from sophomore practicum.
6. CLT/MLT certification.
7. Completion of application form which includes:
  - a. hepatitis B vaccine statement
  - b. signature page attesting to the ability to meet the essential functions of the program (verification of policies)
8. If accepted for a clinical placement, immunizations and health insurance information must be submitted to CastleBranch as well as a criminal background check must be completed and possibly fingerprinting prior to clinical training.

For Medical Diagnostics and Clinical Systems Analyst Concentrations: Students must attain a GPA of 2.6 in the major and NMU/cumulative.

### Eligibility for Certification Exam:

1. Students must pass the NMU CLS comprehensive exam, which is given at the end of the senior practicum.
2. Successful completion of the practicum and all degree requirements.

If the student has not successfully (as described above) completed their practicum or any aspect of the total program prior to the national certifying exams, the recommendation to be allowed to write the examination will be withheld until successful completion of any deficiencies.

### Criteria for CLS Degree:

In order to be granted a baccalaureate degree in Clinical Laboratory Science, a student must have:

1. A GPA of at least 2.6 NMU/cumulative and received no less than a C\* in any required CLS courses. DG students must meet specific course grade requirements.
2. Completed all required courses specified in the Bulletin under CLS curriculum.
3. Granting of the degree is not contingent on passing the national MLS, CG, or MB ASCP certifying exam.
4. Students must pass the CLS Program concentration specific (Medical Laboratory Science, Microbiology) comprehensive exam prior to graduation. After two failed attempts, the student must take a 2-credit CLS directed study to be eligible to re- take the comprehensive exam. As part of each directed study, a student may take the comprehensive exam only twice. If the student fails both attempts, an additional 2-credit directed study is required. There is no limit on the number of directed study attempts.

Transcripts of transfer students from another major or institution will be viewed individually for compliance with these criteria, prior to clinical placement.

**\*A C- or better for all students with a bulletin prior to Fall 2016.**

## **Clinical Laboratory Science Senior Practicum Placement Procedure**

After the sophomore practicum (CLS 250T, 244, 251-253), students wishing to pursue a Clinical Laboratory Sciences degree must make application through their advisor. Students must attain an NMU/cumulative GPA of at least 2.6 before submitting an application for a CLS practicum. Students must apply for the senior practicum by updating their sophomore application on file or submitting a new application. Placement is contingent based upon availability at our practicum sites. Students selected will have a clinical training site reserved provided they meet academic, technical and behavioral criteria and affiliate approval and their requirements. **Academic, procedural and behavioral factors will be assessed by clinical and academic faculty when considering placements.** The student is encouraged to make their preference known to the Director prior to the final decision. Once the hospital assignments have been made, they are final.

**PLACEMENT FOR ANY PRACTICUM CAN NOT BE GUARANTEED** as the program is limited to the hospital capacity at any given time.

**For Medical Laboratory Science or Microbiology Concentration:** CLS 250S, 451-454 or CLS 250M, CLS 440-443 are the courses in which the student will register for their senior practicum. The senior practicum begins in the Fall or the Winter semester for a total of 20 weeks. Prior to this time, the student must seek their own housing accommodations. Two weeks prior to the senior practicum, the student should contact the teaching supervisor of the hospital to which they have been assigned. This will give the supervisor an opportunity to ask any last minute questions or outline any final preparations to be completed before the practicum begins.

**For Anatomic Pathology Concentration:** Students must apply to a hospital-based, accredited program one year prior to their availability for the clinical practicum. It is necessary that the student be in close communication with their advisor to determine how and when the application should occur.



### **Student Capacity/Waiting List:**

Students are not guaranteed clinical placement. Placement into a clinical affiliation (hospital site) is limited by the number of affiliates and each affiliate's student capacity. See the Clinical Affiliation Information Grid for affiliates and student capacity in this manual. If the number of qualified students exceeds the number of clinical places, those students not placed will be put on a waiting list. Should a cancellation occur, the student on the top of the waiting list (see Criteria for Ranking) will be offered the clinical placement. If no cancellations occur, those students on the waiting list may reapply with the next group of applicants.

### **Advanced Placement:**

Students with clinical laboratory experience may be given advanced placement credit for the sophomore and/or senior practicum or partial credit for either. Placement for senior practicum requires MLT certification. Experience must be documented. The Clinical Sciences faculty will use ASCP technical curricula criteria as the basis for evaluating the documentation and making final determinations for the extent of advance placement.

### **Seven Years Dated Transcript:**

Students who have completed formal clinical laboratory sciences courses seven years before application will need to have their transcripts evaluated by the School of Clinical Sciences (after the transcript evaluation office). Students may need to re-take the CLS courses depending on recent experience, continuing education, etc.

### **Foreign Degrees:**

Students who wish to become Clinical Laboratory Scientists and already possess a foreign degree must have their transcript evaluated by the University Transcript Evaluation Office and the CLS faculty. Once evaluated and documented, the student must meet with the CLS adviser to finalize a schedule of courses.

## Criteria for Ranking Clinical Laboratory Technician Practicum Applicants (Medical Laboratory Science or Microbiology)

The following items and conditions can be used in determining student internship placement. Placement is competitive. In addition, affiliate needs as well as student success will be considered when determining placement. Students should inform faculty if any of these situations are in effect when they submit their practicum application. The following factors are considered in the rank order that they are listed. If two students desire the same clinical slot the following factors will be considered:

1. The student with the highest points (max 5 points) will be given preference. The point formula is outlined below:

a. NMU GPA

<2.59	= 0
2.6 - 2.99	= 0.25
3.0 - 3.29	= 0.50
3.3 - 3.59	= 0.75
3.6 - 4.00	= 1.0

b. Post Sophomore Practicum CLS GPA:

<1.99	= 0
2.0 - 2.59	= 0.25
2.6 - 2.99	= 0.50
3.0 - 3.49	= 0.75
3.5 - 4.00	= 1.0

c. Science GPA:  
(Chem, Bio, Physics)

<1.99	= 0
2.0 - 2.49	= 0.25
2.5 - 2.99	= 0.50
3.0 - 3.49	= 0.75
3.5 - 4.00	= 1.0

2. Recommendations from Sophomore Practicum

Would not hire as CLT = 0  
Serious reservations in all domains = 0.25  
Some concerns about technical and academic ability = 0.50  
Recommend (Progressively got better) = 0.75  
High recommendations = 1.0

3. MLT Certification Exam Scores (ASCP)

< 399	= 0
400 - 499	= 0.25
500 - 549	= 0.50
550 - 599	= 0.75
600 & over	= 1.0

4. Whether the student has young children, if so they will be given preference.
5. Students who are married (not engaged) will be given preference.
6. Extenuating circumstances will be considered.



## CLT to CLS Career Ladder Curriculum CLS: MEDICAL LABORATORY SCIENCE

### Phase 1 CLT

SEMESTER 1 (Fall).....		16
BI 104	Human Anatomy and Physiology (F, W) .....	
<b>OR</b> BI 207	Human Anatomy and Physiology (F, W) (F, W: CH 105, 109, 4 or 111—CH can be taken concurrently).	
MA 111	College Algebra (F, W, S) .....	4
CH 111	General Chemistry I (F, W, S: Math Prerequisite) .....	5
CLS 100	Obtaining a Blood Specimen (F, W).....	1
CLS 109	Intro to Diagnostic Sciences (F, W) .....	1
CLS 190	Microscopy & Lab Techniques (F) <b>or</b> CLS 200 (W) .....	1
SEMESTER 2 (Winter)		17
EN 111	College Composition I (F, W, S) .....	4
CLS 201	Clin. Hematology/Coagulation (W: CLS109,190, or BI104—can be 3 taken concurrently) .....	
CLS 203	Immunohematology (W: CLS 213 or concurrent enrollment). 3	
CH 112	General Chemistry (F, W, S: CH 111).....	5
CLS 200	Urine and Body Fluid Analysis (W).....	1
CLS 213	Clinical Immunology & Serology (W).....	1
SEMESTER 3 (Fall)		17
CLS 202	Clinical Chemistry (F).....	4
CLS 204	Clinical Microbiology (F).....	2
CLS 214	Diagnostic Microbiology (F: CLS 204 or concurrent enrollment or IP) 3	
BI 111	Intro to Biology: Principles (F, W).....	4
EN 211	College Composition II (F, W, S: EN 111).....	4
SEMESTER 4 (Winter or Fall) (Sophomore Practicum = 6 months).....		12
(Sophomore Practicum)		
CLS 251	Clinical Hematology Practicum.....	3
CLS 252	Clinical Chemistry Practicum.....	4
CLS 253	Blood Banking Practicum.....	3
CLS 250T	Clinical Practice.....	2
SUMMER SESSION		4
CLS 244	Clinical Microbiology and Blood Bank Simulation Lab... 4	

Associate Degree Awarded

Eligible for MLT (ASCP) certification

Fall 2023

**CLT to CLS Career Ladder Curriculum**  
**CLS: MEDICAL LABORATORY SCIENCE**  
**Phase 2 CLS**

SEMESTER 5 (Fall).....		15-17
SOCR*	Social Responsibility in a Diverse World (+ world cultures?).....	3-4
BI 218	Cell & Molecular Bio. (F,W: BI 111 + CH 111/112 or concurrent enrollment in CH 112) .....	4
*INTT	Integrative Thinking.....	3-4
CH 220	Introduction to Organic Chemistry (F,W: CH 111/112) .....	5
SEMESTER 6 (Winter).....		15-16
CLS 313	Intro. to Clinical Research (F, W, S: BI 207/208 or 104 + Jr. standing)..	1
CLS 401	Hematopathology (W: CLS 201, CLS 251 rec) .....	3
CLS 403	Adv. Clin. Immunohematology (W: CLS 203, CLS 253 rec) .....	2
CLS 410	Clinical Management (F, W, S: DATA 109, junior standing) .....	1
CLS 420	Clinical Educational Practices (F, W, S: Jr.standing).....	1
BI 405	Immunology (W:BI 203 or 303 or CLS 203 or 213 & CH 220 or 325 + junior standing)	}
CLS 416	Cytogenetics and Mol. Diag. (W: BI 312, CLS 436 or CH 450 + junior standing)	}
CH 450	Biochemistry [F, W: CH 220 or CH 322 (or CH 325 + CH 327) + junior standing] .....	}
HUME	Human Expression (World Cultures?) .....	3-4
		<b>3 way option... 4</b>
SEMESTER 7 (Fall)		14-16
CLS 436	Medical Genetics (F: BI 218 or BI 312 or CLS 426) .....	4
CLS 402	Adv.Clinical Chemistry (F:CLS 202, CLS 252 + DATA 109 rec) .	2
CLS 404	Adv.Clinical Microbiology (F:CLS 204 & 214, CLS 254 rec) .....	2
PERS	Perspectives on Society (World Cultures?) .....	3-4
*PERS	Perspectives on Society .....	3-4
SEMESTER 8 (Winter or Fall) (Senior Practicum = 5 months).....		14
CLS 451	Advanced Hematology Practicum.....	3
CLS 452	Advanced Clinical Chemistry Practicum.....	3
CLS 453	Advanced Clinical Immunohematology Practicum.....	4
CLS 454	Advanced Clinical Microbiology Practicum.....	4
SUMMER SESSION		1
CLS 250S	Clinical Practice.....	1
TOTAL CREDITS REQUIRED FOR GRADUATION.....		120 or more

**NMU/cumulative GPA of 2.6 required**

BS Degree Awarded                      Eligible for MLS (ASCP) certification

**Applied Workplace Leadership Minor Courses**

LDR 100 Effective Communication in the Workplace (4)

\*LDR 200 Ethical Leadership in the Workplace (4) – PERS

LDR 220 Assessment in the Workplace (4)

\*LDR 300 Leadership in Diverse Workplaces (4) – SOCR

\*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT

**CLS: MEDICAL LABORATORY SCIENCE ONLINE (Global Campus Students Only)**

**GENERAL AUDIT SHEET**

Name:	NMUIN:
Major: Clinical Laboratory Science	
Concentration: Laboratory Medicine	
Adviser:	Bulletin Year: 2022-2023
Date of Last ACAC Audit or Contact:	

Written English Competency:	
Mathematics Competency:	
2.00 GPA for General Education Courses:	
Course Meeting World Cultures Requirement:	
Course Meeting Laboratory Requirement:	

**126 TOTAL CREDITS REQUIRED FOR DEGREE**

Gen Education (10 Courses)	Sem	Cr	Grd
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**Effective Communication Component  
(Two Courses Required)**

EN 111		4	
EN 211		4	

**Quantitative Reasoning and Analysis  
Component  
(One Course Required)**

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**Social Responsibility in a Diverse World  
Component  
(One Course Required)**

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**Integrative Thinking Component  
(One Course Required)**

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**Human Expression Component  
(One Course Required)**

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**Perspectives on Society Component  
(Two Courses Required)**


**Scientific Inquiry Component  
(Two Courses Required)**


Major (38)	Sem	Cr	Grd
CLS 100		1	AP
CLS 109		1	AP
CLS 190		1	AP
CLS 200		1	AP
CLS 201		1	AP
CLS 203		3	AP
CLS 204		3	AP
CLS 213		2	AP
CLS 313		1	
CLS 410		1	
CLS 420		1	
BI 104 or 207		4	
BI 111		4	
CH 111		5	
CH 112		5	
DATA 109 or MA 111		4	
<b>TRACK 2:***</b>		<b>12</b>	
CLS 412 (F)		3	
CLS 413 (W)		3	
CLS 414 (F)		3	
CLS 426 (W)		3	

Concentration (51)	Sem	Cr	Grd
CLS 202		4	AP
CLS 214		3	AP
<b>CLS 250S</b>		<b>1</b>	
CLS 250T		2	AP
CLS 251		3	AP
CLS 252		4	AP
CLS 253		3	AP
CLS 254		4	AP
CLS 401 (W)		3	
CLS 402 (F)		2	
CLS 403 (W)		2	
CLS 404 (F)		2	
CLS 436 (F)		4	
CLS 489		2	
<b>CLS 451</b>		<b>3</b>	
<b>CLS 452</b>		<b>4</b>	
<b>CLS 453</b>		<b>4</b>	
<b>CLS 454</b>		<b>4</b>	

Electives	Sem	Cr	Grd

**Notes:** \*Note Math requirements for these courses.  
 \*\*\*Track Prerequisites: Students eligible for this track must be enrolled in the [NMU Global Campus](#), be ASCP MLT certified, and hold an associate degree from an NAACLS accredited MLT program or equivalent and have two years of full time medical laboratory technician experience in an accredited clinical laboratory in the last five years. Enrollment eligibility is determined based on CLS advance placement criteria.



**CLT to CLS Career Ladder Curriculum**  
**CLS: MICROBIOLOGY CONCENTRATION**  
**Phase 1 CLT**

SEMESTER 1 (Fall).....		16
BI 104	Human Anatomy and Physiology (F,W) .....	
<b>OR</b> BI 207	Human Anatomy and Physiology (F,W) (F,W: CH 105, 109, 4 or 111—CH can be taken concurrently).	
MA 111	College Algebra (F,W,S) .....	4
CH 111	General Chemistry I (F,W,S: Math Prerequisite) .....	5
CLS 100	Obtaining a Blood Specimen (F,W).....	1
CLS 109	Intro to Diagnostic Sciences (F,W) .....	1
CLS 190	Microscopy & Lab Techniques (F) <b>or</b> CLS 200 (W) .....	1
 SEMESTER 2 (Winter)		 17
EN 111	College Composition I (F,W,S) .....	4
CLS 201	Clin. Hematology/Coagulation (W: CLS109,190, or BI104—can be 3 taken concurrently) .....	
CLS 203	Immunohematology (W: CLS 213 or concurrent enrollment). 3	
CH 112	General Chemistry (F,W,S: CH 111).....	5
CLS 200	Urine and Body Fluid Analysis (W).....	1
CLS 213	Clinical Immunology & Serology (W).....	1
 SEMESTER 3 (Fall)		 17
CLS 202	Clinical Chemistry (F).....	4
CLS 204	Clinical Microbiology (F).....	2
CLS 214	Diagnostic Microbiology (F: CLS 204 or concurrent enrollment or IP) 3	
BI 111	Intro to Biology: Principles (F,W).....	4
EN 211	College Composition II (F,W,S: EN 111).....	4
 SEMESTER 4 (Winter or Fall) (Sophomore Practicum = 6 months).....		 12
(Sophomore Practicum)		
CLS 251	Clinical Hematology Practicum.....	3
CLS 252	Clinical Chemistry Practicum.....	4
CLS 253	Blood Banking Practicum.....	3
CLS 250T	Clinical Practice.....	2
 SUMMER SESSION		 4
CLS 244	Clinical Microbiology and Blood Bank Simulation Lab... 4	

Associate Degree Awarded

Eligible for MLT (ASCP) certification

Fall 2023

**CLS: MICROBIOLOGY CONCENTRATION**  
**Phase 2 CLS**

SEMESTER 5 (Fall) .....		15-17
SOCR*	Social Responsibility in a Diverse World (+ world cultures?).....	3-4
BI 218	Cell & Molecular Bio (F,W: BI 111 + CH 111/112 or concurrent enrollment in CH 112).....	4
*INTT	Integrative Thinking .....	3-4
CH 220	Introduction to Organic Chemistry (F: CH 111/112) .....	5
SEMESTER 6 (Winter) .....		12-16
CLS 313	Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)...	1
BI 405	Immunology (W:BI 203 or 303 or CLS 203 or 213 & CH 220 or 325 and junior standing) .....	4
BI 303	General Microbiology (W:BI 111 and BI 112 or CLS 204 and CLS 214 and CH 220 or CH 315 or CH 321; BI 312 rec) or <b>BI 404</b> .....	4-5
PERS	Perspectives on Society (World Cultures?).....	3-4
HUME	Human Expression Science (World Cultures?) .....	3-4
SEMESTER 7 (Fall) .....		15-16
CLS 436	Medical Genetics (F: BI 218 or BI 312 or CLS 426).....	4
CLS 404	Adv Clinical Microbiology (F:CLS 204 & 214, rec 254) .....	2
CLS 410	Clinical Management (F, W, S: DATA 109 and junior standing)	1
CLS 420	Clinical Educational Practices (F, W, S: Jr standing) .....	1
BI 404	Virology (F, odd years, BI 203 or BI 303, or CLS 204/214, and CH 220, or CH 325, junior standing, or IP) or <b>BI 303</b> ....	
BI 423	Parasitology (F: BI 111 and BI 112 or CLS 204 and CLS 214, junior standing or IP) .....	4
*PERS	Perspectives on Society .....	3-4
SEMESTER 8 (Winter or Fall) (Senior Practicum = 5 months).....		14
CLS 440	Advanced Clinical Micro Practicum .....	8
CLS 441	Advanced Clinical Mycology.....	2
CLS 442	Advanced Clinical Parasitology .....	2
CLS 443	Advanced Clinical Microbacteriology/Virology .....	2
SUMMER SESSION .....		1
CLS 250M	Clinical Practice .....	1
TOTAL CREDITS REQUIRED FOR GRADUATION .....		120 or more

**NMU/cumulative GPA of 2.6 required**

BS Degree Awarded                      Eligible for MLS (ASCP) certification

**Applied Workplace Leadership Minor Courses**

- LDR 100 Effective Communication in the Workplace (4)
- \*LDR 200 Ethical Leadership in the Workplace (4) – PERS
- LDR 220 Assessment in the Workplace (4)
- \*LDR 300 Leadership in Diverse Workplaces (4) – SOCR
- \*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT

Fall 2023



**CLT to CLS Career Ladder Curriculum**  
**CLS: CLINICAL SYSTEMS ANALYST CONCENTRATION**  
**Phase 1 CLT**

SEMESTER 1 (Fall) .....		15
BI 104 <b>OR</b>	Human Anatomy and Physiology <b>OR</b> Human Anat & Phys 1 (F,W:	4
BI 207	Concurrently CH 105, CH 107 or CH 111).....	
EN 111	College Composition I .....	4
CH	Chemistry (above 100) .....	4
CLS 100	Obtaining a Blood Specimen .....	1
CLS 109	Intro to Diagnostic Sciences .....	1
CLS 190	Microscopy and Lab Techniques .....	1
SEMESTER 2 (Winter) .....		14
CLS 201	Clinical Hematology/Coagulation .....	3
CLS 203	Immunochemistry .....	3
CH	Chemistry (above 100) .....	4
CLS 200	Urine and Body Fluid Analysis .....	1
CLS 213	Clinical Immunology and Serology .....	1
CIS 100	Computer Concepts .....	2
SEMESTER 3 (Fall) .....		16-17
CLS 202	Clinical Chemistry .....	4
CLS 204	Clinical Microbiology .....	2
CLS 214	Diagnostic Microbiology .....	3
*SOCR	Social Responsibility in a Diverse World .....	3-4
EN 211	English Composition II .....	4
SEMESTER 4 (Winter) (Sophomore Practicum = 6 months) .....		14
CLS 251	Clinical Hematology Practicum .....	3
CLS 252	Clinical Chemistry Practicum .....	4
CLS 253	Blood Banking Practicum .....	3
CLS 254	Clinical Microbiology Practicum .....	4
SUMMER SESSION.....		2
CLS 250T	Clinical Practice .....	2

Associate Degree Awarded



**CLS: CLINICAL SYSTEMS ANALYST CONCENTRATION**  
**Phase 2 CLS**

SEMESTER 5 (Fall) .....	16
*INTT    Integrative Thinking Elective .....	3-4
CIS 110    Principles of CIS or <b>CIS 112/212</b> Microsoft Apps/Comp. Assisted Problem Solving .....	4
CIS 250    Systems Analysis and Design .....	4
CS 120    Computer Science I (Div 5) .....	4
SEMESTER 6 (Winter) .....	16
CS 122    Computer Science II .....	4
HUME    Human Expression Elective (World Cultures?).....	4
CIS 226    Networks and Security .....	4
MA 109    Probability and Statistics (F,W,S: C- or higher in MA 100).....	4
SEMESTER 7 (Fall) .....	16
CLS 313    Introduction to Clinical Research .....	1
CLS 410    Clinical Management .....	1
PERS    Perspectives on Society Elective (World Cultures?) .....	4
CIS 155    Software Development I .....	4
CIS 415    Systems Development Project or <b>CIS 491</b> Internship .....	2
BI 111    Intro to Biology .....	4
SEMESTER 8 (Winter) .....	13
CIS 440    Mgt Info Sys .....	4
CIS 464    Database Management Systems .....	4
*PERS    Perspectives on Society Elective .....	4
CLS 420    Clinical Educational Practices .....	1
TOTAL CREDITS REQUIRED FOR DEGREE .....	121

**NMU/cumulative GPA of 2.6 required**

BS Degree Awarded                      Eligible for MLS (ASCP) certification

**Applied Workplace Leadership Minor Courses**

- LDR 100 Effective Communication in the Workplace (4)
- \*LDR 200 Ethical Leadership in the Workplace (4) – PERS
- LDR 220 Assessment in the Workplace (4)
- \*LDR 300 Leadership in Diverse Workplaces (4) – SOCR
- \*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT



## CLS: ANATOMIC PATHOLOGY CONCENTRATION

SEMESTER 1 (Fall)		16
CLS 100	Obtaining a Blood Specimen (F,W)	1
CLS 109	Intro to Diagnostic Sciences (F,W)	1
CLS 190	Microscopy & Lab Techniques (F)	1
BI 207	Human Anat & Phys 1 (F,W: Concurrently CH 105, CH 107 or CH 111)	4
CH 111	General Chemistry I (F,W,S:MA 111 or C- or higher in 100)	5
EN 111	College Composition I (F,W,S)	4
SEMESTER 2 (Winter)		17
CLS 200	Urine and Body Fluid Analysis (W)	1
CLS 201	Clin Hematology/Coag (W: CLS109,190, BI 104 or BI 208)	3
EN 211	College Composition II (F,W,S: EN 111)	4
CH 112	General Chemistry (F,W,S: C- or higher in CH 111)	5
BI 208	Human Anat & Phys 2 (F,W: CH 105, CH 107 or CH 111)	4
SEMESTER 3 (Fall)		15-16
CLS 204	Clinical Microbiology (F: CLS 109, BI 104 or BI 208)	2
CH 220	Introduction to Organic Chemistry (F: CH 111/112)	5
*SOCR	Social Responsibility in a Diverse World	3-4
BI 111	Intro to Biology: Principles (F,W)	4
HL 101	Medical Terminology (F,W)	1
SEMESTER 4 (Winter)		15-16
*INTT	Integrative Thinking Elective	3-4
HUME	Human Expression Elective (World Cultures?)	4
BI 218	Cell & Molecular Bio (F,W:BI 111,CH 105 or CH 111/112)	4
CLS 203	Immunohematology (W)	3
CLS 213	Clinical Immunology & Serology (W)	1
SEMESTER 5 (Fall)		14
CLS 436	Medical Genetics (F: BI 218 or BI 312)	4
BI 426	Hum Histo (F, even yrs: BI 111+112 or CLS 201+ BI 104 or 221)	4
CLS 420	Clinical Educational Practices (F: Jr standing)	1
PERS	Perspectives on Social Elective (World Cultures?)	4
CLS 410	Clinical Management (F)	1

### Applied Workplace Leadership Minor Courses

- LDR 100 Effective Communication in the Workplace (4)
- \*LDR 200 Ethical Leadership in the Workplace (4) – PERS
- LDR 220 Assessment in the Workplace (4)
- \*LDR 300 Leadership in Diverse Workplaces (4) – SOCR
- \*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT

## CLS: ANATOMIC PATHOLOGY CONCENTRATION

SEMESTER 6 (Winter).....		16
DATA 109	Probability and Statistics (MA 100).....	4
CLS 313	Intro to Clinical Research (W: BI 207/208 or 104 Jr standing).....	1
BI 405	Immuno (W: BI 203 or 303 or CLS 203 or 213, and CH 220 or 322) .....	3
PERS	Perspectives on Social Elective .....	4
CH 450	Biochemistry I (F,W: CH220, Jr standing or IP)	4

### Histotechnology:

SEMESTER 7 (Fall) Clinical Practicum.....	Must complete a one-year Histotechnology program at an affiliated Hospital	14
CLS 380	Histotechniques I .....	7
CLS 381	Histotechniques II.....	7
SEMESTER (Winter) Practicum Continued .....		16
CLS 382	Histotechniques III .....	3
CLS 383	Histochemistry and Pathology .....	8
CLS 384	Adv Histology.....	5
Summer, Continued Practicum.....		2
CLS 250H	Clinical Practice .....	2
<b>TOTAL CREDITS REQUIRED FOR DEGREE .....</b>		<b>125</b>

### NMU/cumulative GPA of 2.6 required

BS Degree Awarded                      Eligible for MLS (ASCP) certification

Fall 2022



**CLT to CLS Career Ladder Curriculum**  
**CLS: CONCENTRATION: MEDICAL DIAGNOSTICS: CLT TRACK**  
**Phase 1 CLT**

SEMESTER 1 (Fall) .....		16
CLS 100	Obtaining a Blood Specimen (F,W) .....	1
CLS 109	Intro to Diagnostic Sciences (F,W) .....	1
CLS 190	Microscopy & Lab Techniques (F) .....	1
BI 104 <b>or</b>	Human Anatomy and Physiology (F,W) <b>or</b>	
BI 207	Human Anatomy and Physiology I (F,W).....	4
CH 111	General Chemistry I (F,W,S:MA 111 or C- or higher in 100) .....	5
EN 111	College Composition I (F,W,S).....	4
SEMESTER 2 (Winter) .....		17
CLS 201	Clin Hematology/Coag (W: CLS109,190, or BI 104).....	3
CLS 203	Immunohematology (W) .....	3
EN 211	College Composition II (F,W,S: EN 111) .....	4
CH 112	General Chemistry (F,W,S: C- or higher in CH 111).....	5
CLS 200	Urine and Body Fluid Analysis (W).....	1
CLS 213	Clinical Immunology & Serology (W).....	1
SEMESTER 3 (Fall) .....		17
*SOCR	Social Responsibility in a Diverse World .....	4
CLS 202	Clinical Chemistry (F).....	4
CLS 204	Clinical Microbiology (F: CLS 109, BI 104 or BI 208).....	2
CLS 214	Diagnostic Microbiology (F: CLS 204 or concurrent) .....	3
BI 111	Intro to Biology: Principles (F,W) .....	4
SEMESTER 4 (Winter) (Sophomore Practicum = 6 months) .....		12
CLS 251	Clinical Hematology Practicum .....	3
CLS 252	Clinical Chemistry Practicum .....	4
CLS 253	Blood Banking Practicum .....	3
CLS 250T	Clinical Practice .....	2
SUMMER SESSION .....		4
CLS 244	Clinical Microbiology and Blood Bank Simulation Laboratory.....	4

Associate Degree Awarded

Eligible for MLT (ASCP) certification

**CLS: CONCENTRATION: MEDICAL DIAGNOSTICS: CLT TRACK  
PHASE 2 CLS**

SEMESTER 5 (Fall).....		15
DATA 109	Probability and Statistics (F,W,S: MA 100) .....	4
CLS 402	Adv Clin Chem (F: CLS 202).....	2
BI 218	Cell & Molecular Bio (F,W:BI 111,CH 105 or CH 111/112) .....	4
CH 220	Introduction to Organic Chemistry (F: CH 111/112) .....	5
SEMESTER 6 (Winter).....		12
CH 450	Biochemistry (F,W).....	4
*INTT	Integrative Thinking Elective .....	4
*PERS	Perspectives on Society Elective .....	4
SEMESTER 7 (Fall).....		15
CLS 420	Clinical Educational Practices (F: Jr standing).....	1
CLS 410	Clinical Management (F).....	1
HUME	Human Expression Elective (World Cultures?).....	4
CLS 436	Medical Genetics (F: BI 218 or BI 312) .....	4
PH 201	Physics (F,W,S) .....	5
SEMESTER 8 (Winter).....		12
CLS 416	Cytogen Mol Diag (W: BI 312 or CLS 436 or CH 450) .....	3
CLS 313	Intro to Clinical Research (W: BI 207/208 or 104 Jr standing).....	1
PERS	Perspectives on Society Elective (World Cultures?) .....	4
	General Elective .....	4
TOTAL CREDITS REQUIRED FOR DEGREE.....		120

**NMU/cumulative GPA of 2.6 required**

BS Degree Awarded

**Applied Workplace Leadership Minor Courses**

- LDR 100 Effective Communication in the Workplace (4)
- \*LDR 200 Ethical Leadership in the Workplace (4) – PERS
- LDR 220 Assessment in the Workplace (4)
- \*LDR 300 Leadership in Diverse Workplaces (4) – SOCR
- \*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT



**CLS: MEDICAL DIAGNOSTICS: BIOTECHNOLOGY TRACK**

SEMESTER 1 (Fall) .....		16
EN 111	College Composition I (F,W,S).....	4
CH 111	General Chemistry I (F,W,S:MA 111 or C- or higher in 100) .....	5
CLS 100	Obtaining a Blood Specimen (F,W) .....	1
CLS 109	Intro to Diagnostic Sciences (F,W) .....	1
CLS 190	Microscopy & Lab Techniques (F) .....	1
BI 104 or	Human Anatomy and Physiology (F,W) or	
BI 207	Human Anatomy and Physiology I (F,W).....	4
SEMESTER 2 (Winter) .....		17
CLS 201	Clin Hematology/Coag (W: CLS109,190, or BI 104).....	3
CLS 203	Immunoematology (W) .....	3
CH 112	General Chemistry (F,W,S: C- or higher in CH 111).....	5
CLS 200	Urine and Body Fluid Analysis (W).....	1
CLS 213	Clinical Immunology & Serology (W).....	1
EN 211	College Composition II (F,W,S: EN 111) .....	4
SEMESTER 3 (Fall) .....		13
CLS 202	Clinical Chemistry (F).....	4
CLS 204	Clinical Microbiology (F: CLS 109 or BI 104).....	2
CLS 214	Diagnostic Microbiology (F: CLS 204 or concurrent) .....	3
BI 111	Intro to Biology: Principles (F,W) .....	4
SEMESTER 4 (Winter) .....		16
*SOCR	Social Responsibility in a Diverse World .....	4
BI 218	Cell & Molecular Bio (F,W:BI 111,CH 105 or CH 111/112).....	4
*PERS	Perspectives on Society Elective.....	4
*INTT	Integrative Thinking Elective .....	4

## CLS: MEDICAL DIAGNOSTICS: BIOTECHNOLOGY TRACK

SEMESTER 5 (Fall).....		16
CLS 402	Adv Clin Chem (F: CLS 202).....	2
PH 201	Physics (F,W,S) .....	5
CH 220	Introduction to Organic Chemistry (F: CH 111/112) .....	5
BI 4XX	Biology* .....	3-4
SEMESTER 6 (Winter).....		16
HUME	Human Expression Elective (World Cultures?).....	4
DATA 109	Probability and Statistics (F,W,S: MA 100) .....	4
	General Elective (Recommend BI 312) .....	4
CH 450	Biochemistry (F,W) or BI 406 Adv Cell (W) .....	4
SEMESTER 7 (Fall).....		12
BI 4XX	Biology* .....	4
BI 4XX	Biology* .....	4
CLS 436	Medical Genetics (F: BI 218 or BI 312) .....	4
SEMESTER 8 (Winter).....		14
CLS 313	Intro to Clinical Research (W: BI 207/208 or 104 Jr standing).....	1
CLS 410	Clinical Management (F).....	1
CLS 420	Clinical Educational Practices (F: Jr standing).....	1
CLS 416	Cytogen Mol Diag (W: BI 312 or CLS 436 or CH 450) .....	3
PERS	Perspective on Social Elective (World Cultures? 300 level?) ....	4
BI 4XX	Biology* .....	4
TOTAL CREDITS REQUIRED FOR DEGREE.....		120

**\*Note: Students can choose any 4 courses from the following: BI 418, BI 404, BI 406, BI 419, CH 454**

### Applied Workplace Leadership Minor Courses

- LDR 100 Effective Communication in the Workplace (4)
- \*LDR 200 Ethical Leadership in the Workplace (4) – PERS
- LDR 220 Assessment in the Workplace (4)
- \*LDR 300 Leadership in Diverse Workplaces (4) – SOCR
- \*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT

## **Clinical Molecular Genetics**

### **M.S. Degree Program**

Clinical molecular diagnostics is one of the fastest growing areas in the healthcare industry. Molecular based assays are now routinely used to diagnose and monitor genetic disorders, infectious diseases, cancer, amongst others. The Clinical Molecular Genetics program is designed to provide a rigorous graduate level education for clinical laboratory scientists and biologists in the field of molecular diagnostics. The CMG program is intended for laboratory science professionals who are already trained and competent in a medical laboratory or related discipline.

NMUs CMG program places emphasis on developing students to be knowledgeable in the clinical applications of molecular genetic tests for acquired, inherited, and infectious diseases.

The CMG program provides students the ability to complete the degree while working or as a full-time student. The program consists of interactive web-based courses and multiple options for a graduation plan including a capstone, project or thesis. The web-based courses allow students greater flexibility in learning, but are no less rigorous than traditional classroom based courses. Initial courses provide the groundwork knowledge while subsequent courses develop the student's ability to critically apply that knowledge and establish the foundation for a successful thesis or capstone project.

Graduates of the program will be well qualified to work in clinical molecular diagnostic laboratories, research laboratories, the diagnostics industry, and will be well prepared for doctoral training.



## Admission Requirements

Applicants are required to comply with the regular admission requirements of the Office of Graduate Education and Research, which includes an undergraduate grade point average of 3.0. In addition, students must have a Bachelor's degree in Clinical Laboratory Science or Biology. Transcripts of applicants will be evaluated on an individual basis.

**Note:** In cases where the undergraduate GPA is below 3.0, additional factors, including 2 years of clinical laboratory experience or performance in the last 60 hours of course work, may be weighted more heavily in the assessment for admissions.

Applicants should also have:

- *Coursework* in genetics, hematology, microbiology, immunology, molecular biology, chemistry, and statistics.
- *Laboratory experience.* This can be met by documenting one year of clinical laboratory experience or 16 credits of courses accompanied by a lab. Students may be admitted with deficient backgrounds if coursework is met in a defined period of time.
- *Three letters of recommendation* from instructors or professional references. Letters should address the applicant's academic and professional abilities and preparation for graduate study.
- *A statement of intent* must be included which describes the applicant's laboratory skills and experiences, and reasons for pursuing graduate education.

To obtain a NMU graduate degree, a student must achieve a cumulative graduate grade point average (GPA) of 3.0 (B). If a student's cumulative GPA drops below 3.0 in any semester, or if a student earns less than a B in more than six (6) credit hours, the student will be placed on probation. The Office of Graduate Education and Research will notify the student and the relevant department of this action. Students should utilize the Graduate School website to reference specific policies covering admission, tuition, retention, graduation, and thesis requirements.



## MS: CLINICAL MOLECULAR GENETICS - Track 1: Clinical Molecular Genetics

Clinical Molecular Genetics: Track 1 offers different routes to graduation:

- Students choose one of two concentrations: Human Genetics or Infectious Disease
- Within the chosen concentration, students choose between two non-thesis options and a thesis option. A total of 4 credits of CLS 580 (Project) or CLS 590 (Capstone) or CLS 599 (Thesis) are required for the degree.

### Human Genetics Concentration – Project or Capstone or Thesis Option

SEMESTER 1 (Fall) .....		6
CLS 520	Principle of Clinical Molecular Genetics .....	3
CLS 563	Research Design and Methods .....	3
SEMESTER 2 (Winter) .....		8
AIS 535	Using Scholarly Library Resources in Support of Grad Research .....	2
CLS 526	Clinical Molecular Diagnostic Techniques .....	3
CLS 536	Clinical Genetics .....	3
SEMESTER 3 (Spring/Summer) .....		5-6
CLS 516*	Clinical Molecular Diagnostic Laboratory ( <i>Thesis Only</i> ).....	1
CLS 538	Molecular Identification of Somatic Mutations in Cancer	3
CLS 543	Molecular Diagnostic in identity Testing .....	2
SEMESTER 4 (Fall) .....		7
CLS 541	Clinical App of Genomic Medicine .....	3
CLS 570	Method Verification and Validation .....	4
SEMESTER 5 (Winter) .....		7
CLS 560	Biomedical Lab Operations .....	3
CLS 580	Project in Molecular Genetics (1-4 cr).....	4
<b>OR</b> 590	<b>OR</b> Capstone in Clinical Applications of Genetic & Genomic Technologies (1-4 cr)	
<b>OR</b> 599	<b>OR</b> Thesis in Clinical Molecular Genetics (1-4 cr)	
TOTAL CREDITS REQUIRED FOR DEGREE .....		33-34

\*CLS 516 is a 1-week on-campus laboratory course. It is required for students who plan to perform a campus-based laboratory research and thesis.



## MS: CLINICAL MOLECULAR GENETICS - Track 1: Clinical Molecular Genetics

Clinical Molecular Genetics: Track 1 offers different routes to graduation:

- Students choose one of two concentrations: Human Genetics or Infectious Disease
- Within the chosen concentration, students choose between two non-thesis options and a thesis option. A total of 4 credits of CLS 580 (Project) or CLS 590 (Capstone) or CLS 599 (Thesis) are required for the degree.

### Infectious Disease Concentration – Project or Capstone or Thesis Option

SEMESTER 1 (Fall).....		6
CLS 520	Principle of Clinical Molecular Genetics .....	3
CLS 563	Research Design and Methods .....	3
SEMESTER 2 (Winter).....		8
AIS 535	Using Scholarly Library Resources in Support of Grad Research .....	2
CLS 526	Clinical Molecular Diagnostic Techniques .....	3
CLS 545	Molecular Identification of Viral and Fungal Pathogens.....	3
SEMESTER 3 (Spring/Summer).....		5-6
CLS 516*	Clinical Molecular Diagnostic Laboratory ( <i>Thesis Only</i> ).....	1
CLS 543	Molecular Diagnostic in identity Testing .....	2
CLS 544	Molecular Diagnosis of Infectious Disease .....	3
SEMESTER 4 (Fall).....		7
CLS 541	Clinical App of Genomic Medicine .....	3
CLS 570	Method Verification and Validation .....	4
SEMESTER 5 (Winter).....		7
CLS 560	Biomedical Lab Operations .....	3
CLS 580	Project in Molecular Genetics (1-4 cr).....	4
<b>OR</b> 590	<b>OR</b> Capstone in Clinical Applications of Genetic & Genomic Technologies (1-4 cr)	
<b>OR</b> 599	<b>OR</b> Thesis in Clinical Molecular Genetics (1-4 cr)	
TOTAL CREDITS REQUIRED FOR DEGREE.....		33-34

\*CLS 516 is a 1-week on-campus laboratory course. It is required for students who plan to perform a campus-based laboratory research and thesis.



## MS: MOLECULAR GENETICS

### Track 2: Clinical Molecular Laboratory Education

SEMESTER 1 (Fall).....		3
CLS 520	Principle of Clinical Molecular Genetics .....	3
SEMESTER 2 (Winter) .....		8
CLS 526	Clinical Molecular Diagnostic Techniques .....	3
CLS 536	Clinical Genetics .....	3
ED 505	Measurement and Evaluation.....	2
SEMESTER 3 (Spring/Summer).....		5
ED 504	Psychology of Evaluation.....	2
CLS 544	Molecular Diagnosis of Infectious Disease .....	3
SEMESTER 4 (Fall).....		7
CLS 541	Clinical App of Genomic Medicine .....	3
CLS 570	Method Verification and Validation .....	4
SEMESTER 5 (Winter) .....		7-10
CLS 560	Biomedical Lab Operations .....	3
CLS 522	Curriculum Development.....	3
CLS 580	Project in Clinical Molecular Genetics .....	1-4
TOTAL CREDITS REQUIRED FOR DEGREE.....		33

# Applications for Clinical Placement

**Clinical Sciences**  
**Application Form Instructions**

Please complete the required forms and submit to the **School of Clinical Sciences, West Science Room 3515** and we will initial and date.

1. Complete the information requested on the cover page of the application. Identify the semester and year that you will complete the specified practicum.
2. Read and sign the Hepatitis B Policy page.
3. Read and sign the Verification of Policies page. Be certain to read the ‘Essential Functions’ in the Policy Manual.

**Upon Admission to the Program**

**Affiliate Requirements**

Each affiliate has its own set of onboarding requirements. These requirements typically include:

1. Forms/paperwork
2. Drug screening
3. Background check
4. Immunizations

**The requirements for your practicum location are listed on your clinical placement agreement form, which will be emailed to you following placement. The deadline to when all of your requirements must be completed is also on your clinical agreement form.** Affiliates necessitate all requirements to be completed well in advance of your practicum start date.

**Faculty Rights**

**The student is continuously reviewed for placement. If at any time the faculty feel it is inadvisable to place the student due to conduct, behavior, academic standing, failure to meet some of the technical standards or anything which would seriously question whether the student would be able to succeed in a practicum, the student will be withheld from placement. The student may also be removed from the practicum for any of the above reasons at any time.**

**If practicum requirement deadlines are not met, your admission to the program may be rescinded.** Contact any School of Clinical Science faculty if you have questions regarding the application process.

**Clinical Laboratory Sciences  
Application Form for Clinical Placements**

Date Received: (and/or reactivated)

Name: \_\_\_\_\_

Email: \_\_\_\_\_

IN #: \_\_\_\_\_

Practicum Type	Indicate Year		Practicum Type	Indicate Year	
	Summer/Fall	Winter/Spring		Summer/Fall	Winter/Spring
CLT			CLS-Microbiology		
CLS-Lab Medicine			Anatomic Pathology		

Local Address \_\_\_\_\_

Phone: \_\_\_\_\_

Home Address \_\_\_\_\_

Phone: \_\_\_\_\_

**DEADLINE:**  
December 10 and April 10  
for Summer/Fall and  
Winter/Spring practicum  
respectively.

**Submission Instructions:**

- 1) On the back of this page or a separate sheet, please:
  - a. List any certification credentials you hold in the health field.
  - b. Describe any work experience that may relate to this career interest. (Give name of employer, job description, length of employment, reason for leaving).
  - c. Describe why are you pursuing this career interest?
- 2) Visit your advisors and have them sign the bottom of this page.
- 3) Prior to the deadline listed above, hand in the application to Andrew Wirtanen, 3515 The Science Building or email a scan to [awirtane@nmu.edu](mailto:awirtane@nmu.edu).

\_\_\_\_\_  
Reviewed by Success Advisor (Sign and Date)

\_\_\_\_\_  
Reviewed by Faculty Advisor (Sign and Date)

Northern Michigan University · School of Clinical Sciences

VERIFICATION OF IMMUNIZATION AND HEALTH STATUS FOR CLINICAL PLACEMENT

Part I (To be submitted to CastleBranch upon admission)

NAME: (Last) (First) (Middle Initial) (Date of Birth)

ADDRESS:

APPLICATION REQUIREMENTS:

For the protection of patients, students, and employees, the School of Clinical Sciences requires that students document the following before their clinical experience:

- Tuberculin test in the past six months
- Varicella, rubella, and rubeola immunity
- Up-to-date diphtheria and tetanus shots
- Hepatitis B vaccination or signed declination
- Annual influenza or signed declination

MEASLES Two immunizations after 12 months of age
Date
Date

OR Documentation of disease by physician
OR Titer results indicating immunity
OR One immunization Date
of MMR after 1989 Date

RUBELLA Immunization after
12 months of age.

OR Documentation of disease by physician
OR Titer results indicating immunity

HEPATITIS B Recombivax Vaccine series Dates
Heplisav Vaccine series Dates Received
OR Titer results indicating immunity

TETANUS/DIPHTHERIA Vaccination Date
PERTUSSIS Tdap Date (within 10 years?)

VARICELLA Have you had chicken pox? Yes
OR Titer results indicating immunity
OR Varivax Vaccine Two doses Dates Received

Signature\*

Date

\*This form must be signed by a physician, nurse practitioner, registered nurse, or other licensed health official.

ADDITIONAL INFORMATION: (To Be Completed by Associate Dean and Director, School of Clinical Sciences)

- 1. Professional/Student liability insurance coverage: Yes No
If yes, company and policy number:
2. The student has been educated in universal precautions at the University regarding the appropriate handling of blood, tissue, and body fluids. However, it is expected that students will participate in the clinical agency's orientation and safety program at the beginning of the practicum.

Signature



Northern Michigan University · School of Clinical Sciences

VERIFICATION OF IMMUNIZATION AND HEALTH STATUS FOR CLINICAL PLACEMENT

**Part II (To be submitted to CastleBranch upon admission)**

NAME: \_\_\_\_\_  
(Last) (First) (Middle Initial) (Date of Birth)

ADDRESS: \_\_\_\_\_

INFLUENZA Immunization \_\_\_\_\_ Date  
To be obtained in current fall season

\_\_\_\_\_  
Signature\* Date

**\*This form must be signed by a physician, nurse practitioner, registered nurse, or other licensed health official.**

TUBERCULIN TEST Negative TB Test \_\_\_\_\_ Date (within 6 months prior to placement)  
Negative TB Test \_\_\_\_\_ Date (second step test date if required 1-2 weeks apart)  
OR Negative Chest X-Ray \_\_\_\_\_ Date  
OR QuantiFERON Gold Test \_\_\_\_\_ Date Circle Results Pos Neg

\_\_\_\_\_  
Signature\* Date

**\*This form must be signed by a physician, nurse practitioner, registered nurse, or other licensed health official.**

HEALTH INSURANCE:  
Company and policy number: \_\_\_\_\_

You may also be required to complete drug screening and finger printing dependent upon your clinical placement site.

**NORTHERN MICHIGAN UNIVERSITY**  
**College of Health Sciences and Professional Studies**  
**Hepatitis B Policy**

**Hepatitis B Policy Rationale**

According to the Centers for Disease Control (CDC) [www.cdc.gov](http://www.cdc.gov), health care personnel are among the high-risk groups for Hepatitis B infection. Health science students are at risk for infection caused by the Hepatitis B virus because they are often exposed to blood and body fluids during their clinical practice. Your individual risk is directly related to how often you are exposed to blood and other body fluids.

Hepatitis B is primarily a blood-borne pathogen with lower concentrations of virus found in semen, vaginal fluid, and saliva. Between 5% and 70% of Hepatitis B infections are asymptomatic, 20%-30% of those infected exhibit clinical jaundice followed by a benign resolution of the infection. Approximately 10% of infected individuals become chronic carriers of the virus for more than 6 months and have a higher risk of liver disease, including liver failure, liver cancer or cirrhosis.

In view of the hazards associated with Hepatitis B, as cited by the Centers for Disease Control, the College of Health Sciences and Professional Studies at Northern Michigan University recommends that every student in its programs consult with their personal physician or health care provider and seriously consider vaccination with the Recombivax HB vaccine prior to admission to his or her major. The CDC recommends vaccination for anyone frequently exposed to blood and other body fluids in the workplace. Serum derived from the genetically engineered Recombivax HB is considered safe and effective by CDC. Between 90% and 96% of those who receive the full course of therapy (through injections) acquire immunity, which seems to be long term. As in the case with many infectious diseases and the use of vaccinations there is an element of risk and no assurance of full protection. You should inform yourself thoroughly and consult with your personal physician or health care provider.

I acknowledge that I have read the College's rationale regarding Hepatitis B and Hepatitis B vaccines. My questions regarding this disease and the vaccines available have been satisfactorily answered. I shall assume full responsibility for consulting with a physician or health care provider on this matter.

I understand that receiving the vaccine is strongly recommended but is entirely voluntary and is not a condition for being a student in the College of Health Sciences and Professional Studies. I also understand that, should I accept the vaccine, it is my responsibility to complete the series of three injections as recommended. The second injection in the series will be given one month after the first injection, and the final injection will be given six months from the first.

\_\_\_ I have already received a Hepatitis B vaccine and I will supply verification of this.

\_\_\_ I hereby request that I be given Recombivax HB or Heplisav vaccine. I understand that I must make arrangements for this at the NMU Health Center or other health care provider and that it is at my expense.

\_\_\_ I hereby decline the vaccine, and release the College of Health Sciences and Professional Studies, all employees and Board members of the University of liability in the event that I become infected with the Hepatitis B virus.

I fully recognize the hazards in health care professions and hereby hold Northern Michigan University harmless from any liability resulting from its action in providing me with the information set forth in the Hepatitis B policy on this form and further hold the University harmless from any liability from my voluntary decision to be vaccinated or to decline to be vaccinated.

Student Name \_\_\_\_\_ Program \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

**School of Clinical Sciences**  
**VERIFICATION OF POLICIES**

I have read the **Student Policy Manual**, and **fully understand**:

1. The function/job description/duties of my clinical profession. I can meet these standards based on my existing skills and abilities or using typical corrective devices (See essential functions each program in the Student Policy Manual). If I require reasonable accommodations, I have contacted the ADA Office.
2. The safety precautions.
3. That I am **required** to have health insurance coverage
4. That I am **required** to obtain all vaccinations including:

**TB Screening**

- A baseline TB screening, **using two-step**, TST process OR QuantiFERON-Gold blood test to test for infection with *M. tuberculosis*.
- Anyone with a baseline positive or newly positive test result for *M. tuberculosis* infection (i.e., TST or BAMT) or documentation of treatment for Latent TB Infection (LTBI) or TB disease should receive one chest radiograph result to exclude TB disease (or an interpretable copy within a reasonable time frame, such as 6 months). Repeat radiographs are not needed unless symptoms or signs of TB disease develop or unless recommended by a clinician.

**Immunizations** - Immunization status will be verified for the following diseases as determined by the most current recommendations from the CDC: Rubeola, Mumps, Rubella, Diphtheria, and Varicella. Immunity status may be determined by following acceptable methods established by the CDC.

Acceptable methods for determining immunity are:

- **Rubeola (Measles)**: Two doses of a measles containing vaccine such as a MMR vaccine OR laboratory confirmation of disease.
- **Mumps**: Two doses of a mumps containing vaccination such as a MMR vaccine OR laboratory confirmation of disease.
- **Rubella**: One dose of a rubella containing vaccinations such as a MMR vaccine OR laboratory confirmation of disease.
- **Pertussis**: A single adult dose of a Tdap vaccine. Td vaccination does not fulfill this requirement.
- **Varicella**: Two doses of the Varicella vaccine OR laboratory confirmation of disease OR diagnosis of history of Varicella or Herpes zoster by a healthcare provider.
- **Hepatitis B**: Recombivax HB Hepatitis B three-dose series vaccine, Heplisav two-dose series vaccine, laboratory confirmation of immunity, OR a signed declination.\*
- **Influenza** - Proof of vaccination for the current year by October 31 or first day of flu season.

5. The criteria for clinical site placement and application procedures.
6. That I must submit a Drug Screening.
7. That I must submit to a Criminal Background Check.
8. That I am **required** to authorize release of all records and information pertaining to any convictions for criminal and other offenses/violations.

I hereby authorize the release of all records and information pertaining to any and all convictions for criminal offenses, ordinance violations or penalties for violation of University Regulations on file in the Dean of Students office of the University, at the Michigan State Police Central Records Division, the Public Safety Department of the University, or any other criminal justice agency concerning myself, and I hereby consent to the use of communication among the faculty and administration of the School of Clinical Sciences of records, information and evaluation materials pertaining to continuing in the School of Clinical Sciences at Northern Michigan University. In addition, I understand that I am responsible for notifying the director of the School of Clinical Sciences of any convictions between now and the completion of my program.

Any questions that I may have had about the above Standards and policies have been answered by program faculty to my satisfaction.

Name \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Witness Name \_\_\_\_\_

Witness Signature \_\_\_\_\_ Date \_\_\_\_\_

Attach any documentation pertaining to the above requirements. This form must be submitted with clinical placement application.

\*If declination waiver is submitted without signed medical reasoning, your placement may be rescinded by the affiliate