Northern Michigan University

College of
Health Sciences and Professional Studies

School of Clinical Sciences

Policy Manual

2019 - 2020 Edition
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Please reference the most current policy manual online at: [http://www.nmu.edu/clinicalsciences/clinical-policies-and-procedures](http://www.nmu.edu/clinicalsciences/clinical-policies-and-procedures)

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THE SCHOOL OF CLINICAL SCIENCES

Mission

The Mission of the School of Clinical Science is to educate Clinicians from all backgrounds. We seek to embrace all members of society as students in innovative, culturally sensitive and diverse problem-based learning programs. Our goal is to serve the regional and a global community with skills, respect and compassion. This school strives to provide excellent instruction such that graduates will be highly successful in attaining certification, employment, and professional development.

Philosophy

The faculty of the School of Clinical Sciences believes they must provide high quality, effective, professionally and technically oriented educational programs as described by the various professional and certification agencies. The school recognizes the ever-changing role of the clinical practitioner and believes the curriculum must include features to foster adaptability in its graduates while maintaining a current relevant curriculum. The school embraces the concept of the career-ladder education approach in curriculum design and fosters innovative ways to present education.

The School recognizes the important balance between biology, chemistry and clinical courses in the preparation of a clinical professional and therefore adapts an interdisciplinary approach where applicable in curriculum design to provide the depth and breadth needed for a specialized knowledge base.

The faculty not only serves the student but the community and profession as a whole. Therefore, the faculty must serve as professional role models for students and provide leadership in cooperation with other organizations and agencies in promoting the profession and resolving professional issues.

The following goals are identified as necessary to fulfill the program’s philosophy; the School must:

1. Provide sufficient clinical training in all areas of the profession to attain competency and proficiency as a technical support clinical professional. It is recognized that ‘all’ aspects of the profession may not be performed but that the student has gained competency in techniques representative of and applicable to most procedures and/or processes.

2. Provide appropriate levels of clinical training with extensive academic support.

3. Include clinical and simulated experiences and academic courses to promote adaptable multi-tasking skills among the graduates as they become exposed to varied technologies, responsibilities and future opportunities.

4. Continuously evaluate and implement (as appropriate) auto-tutorial instruction which may include computer-aided instruction and audio-visual programs.

5. Incorporate clinical experiences as appropriate throughout the curriculum in order to provide students with marketable skills during the process of their education.

6. Closely monitor the job market and appropriately counsel students based upon this information.
7. Periodically undergo program review to meet accreditation or approval standards as set forth by the appropriate accreditation agencies. The program evaluation process must be frequent and in full cooperation with its academic and clinical faculty, students and administrators.

If it is determined that a program is no longer viable a teach out plan will be established that assures all current students in the program have a reasonable opportunity to complete the program in the normal time frame. The plan will be established as part of the administrative process to suspend or close a program.

8. Produce graduates who successfully complete appropriate certification exams and are highly competitive in securing future employment or advance education as appropriate.

9. Provide continuing education activities for community and regional practicing professionals.

10. Hold membership and actively participate in the professional societies.

11. Provide mentorship to students in the academic and clinical settings.
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, Clinical Laboratory Scientist, and Cytogenetics and Diagnostic Molecular Science 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.

The Clinical Assistant program requires no accreditation but is approved by NAACLS.

Joint Review Committee on Education in Radiologic Technology
20 Wacker Drive, Suite 2850
Chicago, IL 60606-2091
Phone: 312-704-5300

The Radiography Program is accredited by the Joint Review Committee on Education in Radiologic Technology with NMU as the sponsoring agency.

Commission on Accreditation of Allied Health Education Programs
25400 US Highway N, Suite 158
Clearwater, FL 33763
Phone: 727-210-2350

The Cytotechnology program is accredited by the Commission on Accreditation of Allied Health Education Programs with the clinical affiliates as the sponsoring agencies.

Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC/STSA)
6 West Dry Creek Circle, Suite 110
Littleton, CO  80120-8031

The Surgical Technology Program is accredited by CAAHEP with NMU as the sponsoring agency.
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.

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.

3. Compete effectively in the job market with an 80% or better placement rate and/or matriculate successfully into an advanced course of study.

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.
NMU ADMISSIONS POLICIES

Non-Discrimination Policy
Northern Michigan University does not unlawfully discriminate on the basis of ancestry, race, color, ethnicity, religion or creed, sex or gender, gender identity*, gender expression, genetic information, national origin, immigration status (unless restricted by State or federal laws and regulations), age, height, weight, marital status, familial status, pregnancy, handicap/disability, sexual orientation, military or veteran status, or any other characteristic protected by federal or state law in employment or the provision of services. NMU provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

*“Gender Identity” means an individual’s actual or perceived gender, which includes transgender and gender fluid, and also takes into account an individual’s self-image, appearance, expression, or behavior, whether or not that self-image, appearance, expression, or behavior is different from that traditionally associated with the individual’s sex assigned at birth.

This policy procedure is designed for most discrimination complaints other than sex discrimination/harassment. Please see the Sexual Misconduct Policy for complaints of sex discrimination/harassment. For more information on university policies, student rights and responsibilities, and the student code, see the NMU Student Handbook.

The Dean of Students Office, 2001 Hedgcock, 227-1700, handles student on student discrimination/harassment complaints. Violations of the Student Code are handled through the Dean of Students Office.

The Equal Opportunity Office, 105 Cohodas, 227-2420, handles employee, applicant, and student employee discrimination/harassment complaints.

If you are uncertain which procedure applies to your complaint, please contact the Equal Opportunity Office at 227-2420 or e-mail jakoski@nmu.edu.

Admission Requirements and Application Procedures
Admission requirements differ depending on the status of the applicant (first-year student, transfer, etc.) and the level of academic program. The “apply by student type” pages describe the credentials considered, the admission requirements, and the application procedures for each applicant status and program level in more detail.

Secondary School Preparation
Michigan students should follow the Michigan Merit Curriculum, and all students are strongly encouraged to take core courses as recommended by the Presidents Council (State Universities of Michigan):

- Four years of English
- Four years of college preparatory mathematics
- Four years of social studies
- Four years of science
- Two years of world language

Beyond these core courses, students are encouraged to take courses or get experience in the arts and information technology.
Computation of High School Grade Point Averages

NMU will use the overall cumulative GPA reported on the high school transcript. If a high school computes more than one GPA (e.g. weighted and unweighted), we will use the higher of the two. For applicants with a GED earned prior to January 2014, the “score average” is equated to a grade point equivalent for admission and scholarship purposes. GEDs earned after January 1, 2014, will be reviewed based on new guidelines and will not be equated to a GPA.

Computation of College Grade Point Averages

In calculating the grade point average of transfer students, Admissions computes college-level courses only, using credits attempted and honor points earned.

Standardized Achievement Testing

All applicants for baccalaureate programs (and some certificate and associate level programs) must take the ACT or SAT. NMU accepts results of either test and considers them equally for admissions and scholarship consideration. NMU will accept either the "old" SAT (2015 or earlier) or redesigned SAT (beginning in 2016). We will always consider the highest equivalent composite or total score of all provided. We consider each test administration separately (we do not "superscore"). We do not require the ACT writing test or SAT essay. ACT and SAT scores are considered official if provided on the official high school transcript or sent directly from the testing agency.

Exceptions to the test policy are granted to those who: (1) will have earned 12 or more semester hours of college-level credit taken after high school graduation; (2) are international students other than Canadian; (3) are persons who have been out of high school for three years or more; and (4) are applicants to some associate, certificate, and certification programs.

Students intending to pursue an education program should provide their ACT/SAT scores even if exempt as noted above.

Transcripts

Admission decisions are made on official documents. Applicants should request that official transcripts be sent directly to the NMU Admissions Office (1401 Presque Isle Ave., Marquette, MI 49855) from each high school and college/university/trade school attended. Students who have earned a GED must have an official score report sent to NMU from the testing center.

Electronic transcripts via Parchment/Docufide and escrip-safe and other secure transcript providers are considered official and may be submitted electronically directly to the NMU Admissions Office through those systems. Please check with your high school guidance office, or college records office, to determine if your school participates with any of these service providers.

If you have completed secondary or post-secondary academic work at a non-U.S., non-Canadian* institution:

- Request official, original transcripts of ALL secondary and post-secondary academic work, which could include official certificates showing results of any standardized examinations taken in your home country ("O" levels, "A" levels, etc.), and submit directly to NMU Admissions.
• Submit all non-U.S., non-Canadian* secondary and post-secondary academic records to an external agency for a credential evaluation. A "Course-by-Course" report --or equivalent--must be selected. NMU uses the information on the report to help determine admissibility and any transfer of credit. (NMU will notify you if a subject analysis report is needed to determine transfer credit.)
• Exceptions: If you have completed more than the equivalent of 12 U.S. college level semester credits after secondary school completion, you may submit only post-secondary transcripts to NMU and to the external credential evaluation agency.

If, at the time of application to NMU, you have course work in progress at a non-U.S./non-Canadian* institution, you must also submit your additional documents for evaluation upon completion of your current study. There may be an additional fee to the agency for this. Upon receipt of the final report, NMU will review your admission status again to insure that you meet admissions requirements. *An evaluation of credits may be requested for some Canadian institutions' documents. Evaluations may be waived for some international schools affiliated or aligned with U.S. institutions or IBO World Schools. NMU will notify applicants regarding any exceptions.

NMU accepts evaluations from these three agencies (and others may be considered if part of NACES):

1. Education Credential Evaluators (ECE) This service allows applicants to submit their official educational documents only once--to ECE. NMU would then receive the verified documents from ECE along with the credential evaluation.
2. World Education Service (WES) Students may elect to order the WES ICAP service. This service allows applicants to submit their official educational documents only once--to WES. NMU would then receive the verified documents from WES along with the credential evaluation.

Home School Policy

Home schooled students must supply:

• A high school transcript. This transcript can be from a home school curriculum agency, or can be parent (or instructor) generated. If the transcript is parent or instructor generated, we ask that it contain a notarized signature of the person responsible for the official academic record so we can accept it as an official document. The transcript should list courses completed and grades earned. A student may apply while their final coursework is still in progress, but we must receive a “final” transcript indicating date of graduation prior to enrollment at Northern.
• An official ACT or SAT score report. Check with the ACT or SAT organizations for test dates and for information on how to have your scores sent to us.
  o ACT information is available at: www.act.org/aap
  o SAT information is available at: www.collegeboard.com

The admission requirements are a 2.25 grade point average and a 19 ACT or 990 SAT. Keep in mind that while these are the general admissions requirements, certain departments require a specific college GPA before admission is granted into those academic programs.
Students are eligible for registration or for graduation after they have fulfilled all requirements, including the payment of all financial obligations to Northern Michigan University. Students who incur obligations while enrolled may have their enrollment terminated administratively and summarily for failure to pay that obligation.

Information regarding:

- Undergraduate and Graduate Student Tuition and Fees can be found at [https://www.nmu.edu/tuition](https://www.nmu.edu/tuition)

- Payment Plans can be found at [https://www.nmu.edu/studentservicecenter/payment-plans](https://www.nmu.edu/studentservicecenter/payment-plans)

Senior Citizen Scholarship

Senior citizen applicants, aged 62 or older, are provided a full tuition scholarship by Northern Michigan University. The scholarship covers tuition only for on-campus classes; it does not provide for books, fees or tuition for off-campus or web-based classes. To be eligible for this program, the senior citizen should submit an application for admission (no application fee) to the Admissions Office. Students should then register for courses in the Student Service Center, where they will be asked to provide proof of age.

Based on receipt of the Senior Citizen Scholarship award from NMU, students will not be eligible to receive additional University funded scholarships and grants. This will include departmental scholarships, but does not include departmental prizes that are awarded on an annual basis.
TUITION AND FEES REFUNDS

The university grants refunds for students who withdraw from the university or reduce their credit-hour load within specified time frames. The computed amount is credited to the student’s account and all university obligations are deducted. The balance is returned (prorated) to applicable payment sources, with any refund due the student issued via university check.

Steps in the Refund Process
1. Student withdraws or reduces credit hours.
2. Tuition refund credit is calculated and applied to student's account.
3. Room and board/apartment rent credit is calculated and applied to student's account.
4. Financial aid adjustments are calculated and applied to student's account.
5. Any other charges in student’s account are deducted from credit.
6. Credit balance is allocated to applicable payment sources.
7. Refund is returned to the payment source(s); if a credit balance remains, the student is issued a refund. The amount of the tuition and fee refund credit depends upon the time of withdrawal, measured in calendar days. Refunds of Title IV funds are made in accordance with federal regulations.

Complete Withdrawal
Complete withdrawal from the university must be initiated in the Dean of Students Office. Students who are not able to withdraw in person are required to call the Dean of Students Office at 906-227-1700. Withdrawal prior to the first official day of classes will result in a 100% refund credit.

Reduction in Credit Hours
Reduction of credit hours may affect financial aid status. Students should contact the Student Service Center or the Financial Aid Office to determine the impact of a proposed change.

Complete Withdrawal Tuition Refund Schedules
Once classes begin, tuition refunds are calculated for complete withdrawals as follows:

Fall/Winter Semester Complete Withdrawal Tuition Refund Schedule
(Time Period and Refund Credit %)

On or Before the First Day of Class: 100%
2nd Calendar Day - 11th Calendar Day: 90%
12th Calendar Day - 28th Calendar Day: 50%
29th Calendar Day - 56th Calendar Day: 25%
57th Calendar Day - End of the Semester: 0%

Note: The student discretionary activity fee and the student athletic event fee are non-refundable.
Summer College Complete Withdrawal Tuition Refund Schedule:

First Official Day of Classes through Day Three: 100%

Day Four through End of Course: 0%

Reduction in Credit Hours Tuition Refund Schedules:
Students who reduce their credit hours are granted a refund credit for tuition and fees as follows:

Fall/Winter Reduction in Credit Hours Tuition Refund Schedule

First day of classes through the 9th calendar day, all courses: 100%

After the 9th calendar day, all courses: 0%

Note: No refunds are given for reduced credit hours within the 12-16 credit hour flat rate tuition range.

Summer Semester Reduction in Credit Hours Tuition Refund Schedule:
Course Length:

12 weeks: First Friday of the class: 100% Refund

8 weeks: First Wednesday of the class: 100% Refund

6 weeks: First three days of the class: 100% Refund

Note: To receive a refund for classes that meet for less than six weeks, the student must withdraw by the last business day prior to the first day of classes.
CLINICAL SCIENCES
FACULTY AND AFFILIATIONS

NORTHERN MICHIGAN UNIVERSITY

- Vacant, Dean, College of Health Sciences and Professional Studies
- Dr. Paul Mann, Associate Professor, Program Director and Associate Dean and Director, Clinical Sciences (pmann@nmu.edu)
- Ms. Paula Genovese, Instructor, Clinical Sciences (pgenoves@nmu.edu)
- Ms. Heather Isaacson, Assistant Professor, Speech/Language/Hearing Sciences (hisaacso@nmu.edu)
- Ms. Diane Jandron, Speech Clinic Director, Speech/Language/Hearing Sciences (dsavolai@nmu.edu)
- Dr. Matthew Jennings, Assistant Professor, Clinical Sciences (majennin@nmu.edu)
- Dr. Maryam Kamal Khaledi, Assistant Professor, Speech/Language/Hearing Sciences (mkhaledi@nmu.edu)
- Ms. Heather Isaacson, Assistant Professor, Speech/Language/Hearing Sciences (hisaacso@nmu.edu)
- Ms. Diane Jandron, Speech Clinic Director, Speech/Language/Hearing Sciences (dsavolai@nmu.edu)
- Dr. Matthew Jennings, Assistant Professor, Clinical Sciences (majennin@nmu.edu)
- Dr. Maryam Kamal Khaledi, Assistant Professor, Speech/Language/Hearing Sciences (mkhaledi@nmu.edu)
- Ms. Janet Labron, Instructor and Clinical Coordinator, Radiography Program (jalabron@nmu.edu)
- Ms. Aimee Larson, Special Instructor, Surgical Technology (aquayle@nmu.edu)
- Mr. Richard Lopez, Instructor and Program Director, Surgical Technology (rlopez@nmu.edu)
- Dr. Lori Nelson, Associate Professor, Clinic Supervisor, Speech/Language/Hearing Sciences (lnelson@nmu.edu)
- Mr. Martin Renaldi, Instructor/Coordinator, Clinical Sciences (mrenaldi@nmu.edu)
- Dr. Mary Stunkard, Assistant Professor, Clinical Sciences (mstunkar@nmu.edu)
- Dr. Shaun Thunell, Assistant Professor and Program Director, Radiography Program (sthunell@nmu.edu)

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

ACAP: Adjunct Clinical Assistant Professor
ACI: Adjunct Clinical Instructor

Clinical Laboratory Technician Program

Aspirus Iron River Hospital & Clinics, Iron River, MI
  Robert Anderson, MD, and Michael Merrick, MD, Pathologists, ACAP
  Kerri Weecks, MT(ASCP), Clinical Teaching Supervisor and Director of the Lab, ACI

Aspirus Ironwood Hospital, Ironwood, MI
  Charles Iknayan, MD, Pathologist, ACAP
  Dennis Aspinwall, MT(ASCP), Clinical Teaching Supervisor, ACI

Aspirus Keweenaw Hospital, Laurium, MI
  Nicole Frantti, MT(ASCP), Clinical Teaching Supervisor, ACI

Baraga County Memorial Hospital, L’Anse, MI
  Cary Gottlieb, MD, Pathologist, ACAP
  Kurt Allert, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

Bellin Health, Green Bay, WI
  Linda Bertola, MT(ASCP), Lab Manager, ACI
  Leah Borchardt, MLT(ASCP), Clinical Teaching Supervisor, ACI
Community Health Center of Branch County, Coldwater, MI
  Regio T. Penna, MD, Pathologist, ACAP
  Jill Duke, MT(ASCP), MBA, Clinical Teaching Supervisor and Director of Lab Services, ACI

Dickinson County Healthcare System, Iron Mountain, MI
  Peter Hamel, MD, Medical Director and Pathologist, ACAP
  Mark Cristanelli, MD, Pathologist, ACAP
  Melissa Laurila, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI
  Valerie Schreck, MLT(ASCP), Clinical Teaching Supervisor and Supervisor, ACI

Essentia Health, Duluth, MN
  Michael Schrandt, MT(ASCP), Technical Manager, ACI
  Denise Miller, MT(ASCP), Clinical Practicum Coordinator, ACI

Memorial Medical Center, Ashland, WI
  Keith Henry, MD, Pathologist, ACAP
  Nancy Caven, MLT(HHS), Clinical Teaching Supervisor, ACI
  Barbara Yox, MT(ASCP), Clinical Teaching Supervisor, ACI

MidMichigan Medical Center - West Branch, West Branch, MI 48661
  Nicholas Hruby, MD, Pathologist, ACAP
  Karen Mercer, MLS(ASCP)MSHSA, Clinical Teaching Supervisor and Lab Director, ACI

Munson Healthcare Otsego Memorial Hospital, Gaylord, MI
  Wendy Stock, MT(HEW), Lab Director, ACI
  Kurt Cancilla, MT(ASCP), Clinical Teaching Supervisor, ACI

OSF St. Francis Hospital, Escanaba, MI
  Cary Gottlieb, MD, Pathologist, ACAP
  Mark Easterwood, MT(ASCP), Lab Director, ACI
  Diane Danhoff, MT(ASCP), Clinical Teaching Supervisor, ACI

Schoolcraft Memorial Hospital, Manistique, MI
  Karen Cirino, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

UP Health System – Bell, Ishpeming, MI
  Jeff Conklin, MD, Pathologist, ACAP
  Gerry Brown, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

UP Health System – Portage, Hancock, MI
  Petio Kotov, MD, Pathologist, ACAP
  Jennifer Heltunen, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

War Memorial Hospital, Sault Ste. Marie, MI
  Chunming Liu, MD, Pathologist, ACAP
  Jennifer Kabat, MLS(ASCP), Clinical Teaching Supervisor and Interim Lab Manager, ACI
Clinical Laboratory Scientist Programs

Essentia Health, Duluth, MN (Laboratory Medicine/Microbiology)
   Michael Schrandt, MT(ASCP), Technical Manager, ACI
   Jessica Becker, MLS(ASCP), Clinical Education Coordinator, ACI
   Jodie Demenge, Microbiology Supervisor, ACI

Genesys Regional Medical Center, Grand Blanc, MI
   Justin Hill, MLS(ASCP)CM, Director and Manager, Laboratory Services, ACI

Mercy Health Partners, Muskegon, MI
   Lori Speer, Laboratory Director
   Annette Crevier, MT(ASCP), Education Coordinator, ACI

Michigan Department of Health and Human Services, Lansing, MI (Microbiology)
   Tonya Heyer, Clinical Coordinator, ACI
   Rebecca Oesterle, Clinical Coordinator, ACI
   Sheri Robeson, Clinical Coordinator, ACI

Sparrow Hospital, Lansing, MI
   George Maier, MT(ASCP), Administrative Director
   Elizabeth Johnson, BS, MLS(ASCP), Education Director, ACI

St. Mary’s Hospital, SSM, Madison, WI
   Ken Chantavat, MLS(ASCP), Operations Manager-Core Laboratory
   Ann Dolan, MLS(ASCP), Clinical Teaching Supervisor, ACI

University of Michigan Health System, Ann Arbor, MI (Microbiology)
   Carol Young and Rosemary Hankerd, Microbiology Supervisors, ACI

UP Health System – Marquette, Marquette, MI
   Martin Matthews, Pathologist and Medical Advisor, ACAP
   Polly Hockberger, MS, CLS, MT(ASCP), Clinical Teaching Supervisor and Lab Director, ACI

Clinical Assistant Program

OSF St. Francis Hospital, Escanaba, MI
   Mark Easterwood, MT(ASCP), Lab Director, ACI

UP Health System – Bell, Ishpeming, MI
   Gerry Brown, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

UP Health System – Marquette, Marquette, MI
   Steven Babcock, MT(ASCP), Supervisor, Specimen Processing Laboratory, ACI

UP Health System – Portage, Hancock, MI
   Jennifer Heltunen, MT(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI

War Memorial Hospital
   Jennifer Kubat, MLS(ASCP), Clinical Teaching Supervisor and Lab Manager, ACI
**Cytotechnology Program**

Wisconsin State Laboratory of Hygiene, Madison, WI  
Daniel F. I. Kurtucz, MD, Pathologist, Medical Director, School of Cytotechnology, ACAP  
Michele Smith, MS, SCT(ASCP), Program Director and Cytology Services Manager, ACI

**Histology Programs**

Beaumont Health System, Royal Oak, MI  
Mohanpal Dulai, Pathologist, Medical Director, ACAP  
Jamie Pert, BS, HTL(ASCP)$^{CM}$MB$^{CM}$, Histology Program Director, ACI

Marshfield Clinic, Marshfield, WI  
George Rupp, Pathologist, Medical Director, ACAP  
Katherine Gorman, HTL(ASCP), Histotechnician Program Director, ACI  
Julie Seehafer, PhD, MT(ASCP)SH, Director, Laboratory Education

**Diagnostic Genetics**

Marshfield Clinic, Marshfield, WI  
George Rupp, Pathologist, Medical Director, ACAP  
Alyssa Barnes, CG(ASCP)$^{CM}$, Cytogenetics Assistant Manager, ACI  
Julie Seehafer, PhD, MT(ASCP)SH, Director, Laboratory Education

Mayo Clinic, Rochester, MN  
Linda Hasadsri, Ph.D., Interim Allied Health Director, ACAP  
Amy Groszbach, MS, MB(ASCP), Molecular Genetics Internship Director, ACI  
Jason Yuhas, CG(ASCP)$^{CM}$, Education Specialist II, Cytogenetics Program, ACI (2018)

UP Health System – Marquette, Marquette, MI  
Seija Kenn, CG(ASCP)$^{CM}$, Cytogenetics Lab Supervisor  
Teri Scott, MS, CG(ASCP)$^{CM}$, Cytogenetics Clinical Coordinator, ACI

**Surgical Technology**

UP Health System – Bell, Ishpeming, MI  
UP Health System – Marquette, Marquette, MI  
Craig Coccia, MD, Medical Advisor, ACAP

**Radiography Program**

Advanced Center for Orthopedics  
Amy Steele R.T. (R), Clinical Instructor

Aspirus Iron River Hospital  
Eric Beauchamp, R.T. (R)(CT), Clinical Instructor  
Julie Beauchamp, R.T. (R), Clinical Instructor
Aspirus Ironwood Hospital
  Kristin Wolter, B.S., R.T. (R), Clinical Instructor
  Samantha Schneller, R.T.(R), Clinical Instructor

Aspirus Keweenaw Hospital
  Benjamin Hainault, R.T. (R)(CT), Clinical Instructor
  Kim Pici, R.T. (R)(CT), Clinical Instructor
  Eve Wakeham, R.T. (R), Clinical Instructor

Ascension St. Joseph – Tawas
  Emily Marciniak, R.T. (R), Clinical Instructor

Baraga County Memorial Hospital
  Dean Jackson, R.T. (R) (CT), Clinical Instructor
  Kelli Johnson, R.T. (R) (CT), Clinical Instructor

Bay Area Medical Center
  Robert Poetzl, R.T. (R), Clinical Instructor

Dickinson County Health System
  Amy Ramme, R.T. (R), Clinical Instructor
  Korie Reid, R.T. (R), Clinical Instructor

Helen Newberry Joy Hospital
  Holly Mischel, R.T. (R) RM, Clinical Instructor

McLaren Flint
  Lisa Isaac, R.T. (R)(CT), Clinical Instructor
  Jan Nowaczyk, R.T. (R)(ARRT), Clinical Instructor

McLaren Macomb
  Shannon Phillips, R.T. (R), Clinical Instructor

Mercy Medical Center
  Katina Barnes, R.T. (R), Clinical Instructor
  Angela Dempsey, R.T. (R), Clinical Instructor
  Donna Triplett, R.T. (R), Clinical Instructor

MidMichigan Health Center Alpena
  Mark Wienczieski, R.T. (R), Clinical Instructor

Munising Memorial Hospital
  Jessie Webster, R.T. (R) (M) RDMS, Clinical Instructor

Munson Healthchare-Charlevoix Hospital
  Eve Campbell, R.T. (R), Clinical Instructor

OSF St. Francis Hospital
  Shelly Kuehl, R.T. (R)(CT)(MR), Clinical Instructor
  Amy Streichert, R.T. (R), Clinical Instructor
  Whittney Salazar, R.T. (R), Clinical Instructor

Saint Joseph Mercy Health System
  Jill Farmer, R.T. (R), Clinical Instructor
Schoolcraft Memorial Hospital
   Lynnelle Nadeau, R.T. (R)(M), Clinical Instructor
   James Pann, R.T. (R)(CT), Clinical Instructor
   Christa Roemer, R.T. (R), Clinical Instructor
   Dorothy Schneider, R.T. (R), Clinical Instructor

Spectrum Health Ludington Hospital
   Jennifer Arnold, R.T. (R), Clinical Instructor

Trinity Health
   Cynthia Milkey, BS, R.T. (R)(CV), Clinical Instructor

University of Michigan Health System
   Debbie Kollar, R.T. (R), Clinical Instructor
   Theo “T.C.” Thornton, BS, R.T. (R), Clinical Instructor
   Rebecca Uckeze, R.T. (R), Clinical Instructor

UP Health System – Bell
   Bethany Olson, B.S. R.T. (R)(M)(BD), Clinical Instructor

UP Health System – Marquette
   Pam Engle, R.T. (R)(M), Clinical Instructor
   Rajani Hyslop, R.T. (R), Clinical Instructor
   Brian Nancarrow, R.T. (R), Clinical Instructor
   Taylor Watters, R.T. (R) (M), Clinical Instructor

UP Health System – Portage
   Justin Hoffmeyer, R.T. (R) (CT), Clinical Instructor

War Memorial Hospital
   Twani Hill, R.T. (R) (M), Clinical Instructor
<table>
<thead>
<tr>
<th>Affiliate</th>
<th>Type of Practicum</th>
<th>*Student Capacity</th>
<th>Enrollment Dates</th>
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<tr>
<td>Aspirus Iron River Hospital, Iron River, MI</td>
<td>CLT</td>
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<td>January &amp; June</td>
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<td>September</td>
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<td>CLT</td>
<td>Varies</td>
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<td>CG – October/April</td>
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<td>CG</td>
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<td>CLS- July &amp; Jan</td>
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<td>4/practicum</td>
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<td>Phlebotomy / CA</td>
<td>1/practicum</td>
<td>January &amp; August</td>
</tr>
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<td>Wisconsin State Laboratory of Hygiene, Madison, WI</td>
<td>Cytotech</td>
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</tr>
</tbody>
</table>

*Varies; depending on staffing and other factors.
1. Your training day varies throughout the practicum; it may start at 6:00 a.m. or later depending on the specific section in which you are scheduled and/or staffing patterns.
2. Most places require scrubs or lab coats.
3. You must have immunizations and criminal background check.
4. You may be required to complete a drug screen and fingerprinting.
5. Holidays are observed.
6. Assignments and projects are required.
7. Manuals and books are required to be purchased depending on the type of practicum.
NON-AFFILIATED CLINICAL SITES
POLICY STATEMENT

Sometimes students are interested in seeking training sites that are close to their home but are not established as an affiliate with Northern Michigan University. Students are asked not to make contact with non-affiliated hospitals/clinics in hopes of securing an internship position with another agency.

The School must adhere to the policies and principles of the accreditation agencies. In addition, the School has an obligation to honor its loyal and long-standing affiliations. Only when the number of eligible students exceeds current placement capacity does the School actively seek additional sites. In cases where the School seeks additional sites at greater distances from the campus, students must be exceptionally strong academically and/or strong in their laboratory skills. They must also possess strong affective characteristics. The School prefers students who will pose few, if any, problems because of the difficulty in tending to these problems from afar. Also, students are the university’s ambassadors and making a first impression is important for all parties involved when establishing a new relationship with an agency. Student selection is obviously important.

Regarding international possibilities; this, too, must be considered carefully. 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.)

The policy of the School of Clinical Sciences is to not establish additional affiliations unless it is in the best interests of the program and follows accreditation policies.

Paul Mann
Associate Dean and Director
School of Clinical Sciences
Professional Memberships

Students are encouraged to join a professional society while pursuing their career goals. Why? Because the annual fees are very low and you get a journal that features the latest issues/topics in the profession! In addition, there sometimes are scholarships associated with the organization for student members. For these reasons, the School of Clinical Sciences encourages you to join and be a part of your profession even before you are out in practice! The Websites are below:

American Association of Blood Banks (AABB): www.aabb.org
American Association for Clinical Chemistry (AACC): www.aacc.org
American Society for Clinical Laboratory Science (ASCLS): www.ascls.org
American Society for Clinical Pathology (ASCP): www.ascp.org/bor
American Society for Microbiology (ASM): www.asm.org
American Society of Cytopathology (ASC): www.cytopathology.org
American Society of Hematology (ASH): www.hematology.org
Association for Molecular Pathology (AMP): www.ampweb.org
Association of Genetic Technologists (AGT): www.agt-info.org
National Society for Histotechnology (NSH): www.nsh.org
American Society of Radiologic Technologists (ASRT): www.asrt.org
American Association for Respiratory Care (AARC): www.aarc.org
American Society of Radiologic Technologists (ASRT): www.asrt.org
American Association for Respiratory Care (AARC): www.aarc.org
Association of Surgical Technologists (AST): www.ast.org
Committee on Accreditation for Education Programs in Surgical Technology and Surgical Assisting: http://www.arcstsa.org
National Board Surgical Technology Surgical Assisting: http://www.nbstsa.org
Commission on Accreditation of Allied Health Programs: http://www.caahep.org

If you have any questions about the professions or journals, please see your advisor.
Clinical Laboratory Sciences Programs
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.
- 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.
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 applications will not be considered a third time.
f. The procedures for notification of placement are confidential and only the student is informed via sealed letter 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 School of Clinical Sciences Associate Dean and Director.
b. Must meet all the program hospital placement criteria.
c. Will be considered for placement only if an opening occurs.
d. Late applicants will be ranked below reactivation applicants for the hospital openings.

Students who applied before the December 10th and April 10th deadlines but were not selected because of deficiencies in their academic record will be given preference over any late applicant, providing the deficiencies are corrected by the end of the semester prior to the hospital practicum. Students must then reactivate their application with the director. Students whose deficiencies still remain (prior to a clinical internship) may be placed on a waiting list after careful individual consideration of their academic record.

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*
Professional Appearance

Your professional appearance begins now. You have made a decision 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 ¼ 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.

I. 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.

II. 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.

III. 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.
POOR PERFORMANCE POLICY FOR LABORATORY BASED MAJORS
(Phlebotomy, CA, 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.

A student can repeat a course with a CLS prefix only once. The student's progress in the repeated courses will be assessed at the time of mid-semester grade reporting to determine if affective, skill and academic objectives of the course are being satisfactorily met. A progress report including faculty recommendations and actions to be taken will be issued to the student at that time. A student having to repeat more than one course in their major will likely affect the progress report and clinical placement.

NOTE: If a student with a CLS major earns less than a C* in two CLS courses in one semester, he/she will not be allowed to continue in the program until a faculty-approved remediation plan is in place. Remediation may or may not be allowed.

Faculty Rights:
The faculty reserve the right to remove any student from the program whose health, 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.

The student may make appeals to the Program Director and/or Associate Dean. Appeals must be written and should explain extenuating circumstances or mitigating factors. The Program Director and/or Associate Dean in consultation with the CLT/CLS Admissions Committee will consider all appeals and render a decision prior to the next available application date.

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

Clinical Assistant and Phlebotomist

As a member of the health care delivery team, a clinical assistant generally works in a clinical/hospital laboratory under the supervision of a laboratory technologist or other medical personnel. The assistant is responsible for collecting blood specimens from patients for the purpose of laboratory analysis. Proper specimen collection and processing is a critical prerequisite to accurate laboratory analysis. As a clinical assistant, (depending on the place of employment), duties will vary from performing phlebotomy, assisting in the office and laboratory to assisting the nurse and/or physician with patient processing or point of care testing.

There is a perennial need for clinical assistants in a variety of settings. Graduates may find employment in: hospitals, clinics, physician’s office, long term care facilities and public health agencies.

Admission into the first semester of the Clinical Assistant program is open to all interested students who meet NMU’s entrance requirements and high school course preparation.

The curriculum is divided into two phases. The first two semesters are comprised of coursework on campus. Students will apply to the practicum component upon completion of the first semester. Completion of the Phlebotomy practicum enables the student to become certified as a phlebotomist. Completion of the Clinical Assistant practicum allows the student to graduate with a certificate as a Clinical Assistant.

The Clinical Assistant Admissions Committee makes its selection based on GPA (minimum of 2.0 overall GPA and in the major), recommendations, faculty assessments and health related work/education experience.

Students may receive advanced placement for experience.

Graduates qualify to take the ASCP Medical Laboratory Assistant certification exam and the ASCP Phlebotomy certification exam.

Eligibility for Certification Exam:
1. Students must pass CLS 150A and CLS 250A.
2. In order to pass CLS 150A, students must:
   a. Must receive $\geq 70\%$ on each exam administered.
   b. Receive a final percentage of $\geq 70\%$ for each Psychomotor Performance Objectives.
   c. Receive a grade of Satisfactory for each of the Affective Objectives. Failure to do so will result in a grade of U for CLS 150A and will impact eligibility of future practicum placements.
3. In order to pass CLS 250A, students must:
   a. Receive a grade of Satisfactory for each of the Performance and Affective Objectives.

   Failure to do so will result in a grade of U for CLS 250A and will impact eligibility of future practicum placements.
Clinical Assistant
Goals and Competencies

The goal is to offer a one-year training program whereby graduates are successful in passing certification examinations, securing employment and can matriculate into an Associate’s degree for Clinical Laboratory Technician.

Competencies
At career entry, the Clinical Assistant will be able to:

1. Demonstrate a knowledge of the health care delivery system.
2. Demonstrate a basic understanding of the anatomy and physiology of body systems and anatomic terminology in order to relate the major areas of the clinical laboratory to general pathologic conditions associated with the body system.
3. Demonstrate competency in specimen collection to include:
   a) proper use of collection equipment and all of the various tubes with or without additives
   b) awareness of special precautions necessary and substances that can interfere with the clinical analysis of blood components (pre-analytical variables).
   c) using proper technique to perform venipuncture and skin puncture proper requisitioning, specimen transport and specimen processing
4. Recognize and practice established policies and procedures to assure quality specimens, infection control and safety.
5. Demonstrate an understanding of the basic components of communication, stress management, professional behavior, and legal implications of the work environment.
6. Demonstrate the proper techniques to perform basic lab tests and QC measures.
7. Demonstrate basic technical nursing procedures, (vital signs, patient transfer, etc.)
8. Demonstrate beginning level office procedures (typing, filing, computer use, communication).
Clinical Assistant
Specific Admission, Placement and Graduation Criteria

All students in CLS 109 interested in continuing in the Clinical Assistant program will be asked to complete a practicum application. The Admissions Committee will select students to fill the available practicum positions. All students will be notified of their status by the end of the second semester. For those students selected, a clinical training site will be reserved providing they continue to meet academic, technical, and affective performance criteria.

PLACEMENT IS NOT GUARANTEED AS THE PROGRAM IS LIMITED TO THE HOSPITAL CAPACITY AT ANY GIVEN TIME.

Specific Criteria:
1. Performance in CLS 100 (S), CLS 109, 190 or 200 and ST 101 (C* or better) and other required science courses.
2. Minimum Grade Point Average = 2.0 overall and in the major.
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 through CastleBranch prior to clinical training. Students may also be required to complete Zero-Tolerance Drug Testing® 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.

NOTE: Final status is determined upon receipt of grades from semester courses.

*A C- or better for all students with a bulletin prior to Fall 2016*
Clinical Assistant Criteria for Ranking 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 2 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

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.

Requirements for granting a certificate in the Clinical Assistant Program:

1. In order to be granted a certificate in the Clinical Assistant Program, a student must have a minimum GPA of 2.0 overall and in the major and have received no less than a C in any of the required clinical laboratory science courses.

2. The student must have taken a minimum of 32 credits as specified in the Bulletin.

3. Granting of the certificate is not contingent on passing the national phlebotomy certification exam.

4. Transcripts of transfer students will be reviewed individually for compliance with these criteria.

5. Students must pass the Program’s comprehensive exam prior to graduation.
# CLINICAL ASSISTANT

## SEMESTER I (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 104</td>
<td>Human Anatomy and Physiology (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>MA 090</td>
<td>Beginning Algebra*</td>
<td>4</td>
</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F) or CLS 200 (W)</td>
<td>1</td>
</tr>
<tr>
<td>ST 101</td>
<td>Clinical Assisting (F,W)</td>
<td>1</td>
</tr>
</tbody>
</table>

*If student pre-places with MA 100 or above, 4 credits of elective are substituted

## SEMESTER 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MGT 240</td>
<td>Organizational Behavior &amp; Management</td>
<td>4</td>
</tr>
<tr>
<td>HL 125</td>
<td>Emergency Care for the Health Professional</td>
<td>3</td>
</tr>
<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 200</td>
<td>Urine and Body Fluid Analysis or CLS 190 (F)</td>
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## SEMESTER 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CLS150</td>
<td>Phlebotomy Practicum (FW), 160 hr</td>
<td>4</td>
</tr>
<tr>
<td>CLS 250A</td>
<td>Clinical Practice (F,W May, CLS 150 prereq), 80 hr</td>
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Credits required for Certificate ..................................................... 32

8/2017
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BI 104</td>
<td>Human Anatomy and Physiology (F,W)</td>
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</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
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<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F) or CLS 200 (W)</td>
<td>1</td>
</tr>
<tr>
<td>MA 090</td>
<td>Beginning Algebra (as needed)*</td>
<td>4</td>
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<tr>
<td></td>
<td>Elective (CLS 100 recommended) (F,W)</td>
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</table>

*If student pre-places with MA 100 or above, 4 credits of elective are substituted

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS150</td>
<td>Phlebotomy Practicum (FW), 160 hr</td>
<td>4</td>
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</table>
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 actual site for the practicum may be anywhere in the greater Upper Peninsula, northern Wisconsin or Minnesota and will most likely require relocation for the 6 months. 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 of the Clinical Practicum
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 four (4) major areas of the clinical laboratory (Hematology, Blood Banking, Microbiology and Clinical Chemistry). This also includes preparing /selecting necessary reagents, controls and instruments used for the procedure.
2. Define and/or identify:
   - principles of basic laboratory procedures
   - fundamental biological characteristics as they pertain to laboratory testing
   - sources of error in laboratory testing
   - 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:
   - recognize common problems and errors
   - take corrective action according to predetermined criteria
   - recognize and report the need for additional testing.
6. Compete effectively in the job market.
7. Demonstrate an adequate knowledge base as defined by the professional organization.

Essential Functions: As described in the essential functions section.
Clinical Laboratory Technician
Specific Admission and Placement Policy

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 Zero-Tolerance Drug Testing® 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 retake 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.* All students will be notified of their status by the end of the second semester. 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. Currently, Northern Michigan University is affiliated with 16 hospitals with a maximum student capacity of 35 for the year dependent upon affiliate availability. 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 and CLS 251-254 are the courses in which the students will register for their laboratory training in the hospital. The winter semester sophomore practicum begins in the first week in January and continues for six months to the end of June; the fall semester sophomore practicum extends from the end of June until the third week of December. Students will need to enroll in CLS 250T for 2 credits during the summer. Prior to beginning, the students must seek their own housing accommodations.

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

**Clinical Laboratory Technician Criteria for Ranking 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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*CH 111</td>
<td>General Chemistry I (F,W,S: MA111 or C- or higher in MA100)</td>
<td>5</td>
</tr>
<tr>
<td>OR CH 105</td>
<td>Chemical Principles (F, W)</td>
<td>4</td>
</tr>
<tr>
<td>BI 104</td>
<td>Human Anatomy and Physiology (F,W)</td>
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<tr>
<td>OR BI 207</td>
<td>Human Anatomy and Physiology (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F) or CLS 200 (W)</td>
<td>1</td>
</tr>
<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
<td></td>
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### SEMESTER 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>*CH 112</td>
<td>General Chemistry (W,S: CH 111 C- or better)</td>
<td>5</td>
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<tr>
<td>OR CH 109</td>
<td>Organic &amp; Biochemistry (F, W)</td>
<td>4</td>
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<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
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<tr>
<td>CLS 201</td>
<td>Clinical Hematology/Coagulation (W)</td>
<td>3</td>
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<tr>
<td>CLS 203</td>
<td>Immunohematology (W)</td>
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<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
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<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
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### SEMESTER 3 (Fall)

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<tr>
<td>General Electives</td>
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<tr>
<td><strong>SOCR</strong></td>
<td>Social Responsibility in a Diverse World</td>
<td>4</td>
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<tr>
<td>CLS 202</td>
<td>Clinical Chemistry (F)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 204</td>
<td>Clinical Microbiology (F)</td>
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<td>CLS 214</td>
<td>Diagnostic Microbiology (F)</td>
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### SEMESTER 4 (Fall & Winter)

(Sophomore Practicum = 6 months) (January-August or July-December Practicum)

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<tbody>
<tr>
<td>CLS 251</td>
<td>Clinical Hematology Practicum</td>
<td>3</td>
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<tr>
<td>CLS 252</td>
<td>Clinical Chemistry Practicum</td>
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<tr>
<td>CLS 253</td>
<td>Blood Banking Practicum</td>
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<td>CLS 254</td>
<td>Clinical Microbiology Practicum</td>
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### SUMMER SESSION

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<tr>
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<tbody>
<tr>
<td>CLS 250T</td>
<td>Clinical Practice</td>
<td>2</td>
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</table>

TOTAL CREDITS REQUIRED FOR GRADUATION.......................... 63

Students who score a predictive value of “C” or better in MA 111 on NMU’s math placement test are exempt from Math, otherwise MA 100 is required

*Any sequence of chemistry above 100 level for 8 credits

**Recommend LDR 300 Leadership in Diverse Workplaces toward the Applied Workplace Leadership Minor

Fall 2019
### SCIENCE TECHNICIAN
(Associate Degree)

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

**TOTAL CREDITS REQUIRED FOR DEGREE** | 64

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Fall 2019
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 a 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

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
- Diagnostic Genetics – 2 tracks: Cytogenetics or Molecular Diagnostics
- Anatomic Pathology
- Clinical Systems Analyst
- Science Technologist – 3 tracks: CLT Certification, Forensics 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 Science Technologist concentrations, all concentrations require an advanced practicum experience. The goals of the clinical practicum are to enable students to:

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.

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.

Goals of the Clinical Practicum
Enable the student to:

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.

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: Diagnostic Genetics

Students in this concentration have an option to earn MLT certification and then proceed to become certified in cytogenetics CG (ASCP), or molecular diagnostics MB (ASCP). Cytogenetics focuses on the identification of abnormalities of chromosomes or regions of DNA associated with pathology and disease. Molecular diagnostics is a laboratory field which focuses on gene mutations and polymorphisms that contribute to disease states. The main difference between the two is that cytogenetics is chromosome based (microscopy techniques) whereas molecular diagnostics is PCR/molecular-based (primarily gel-techniques). Both fields are growing rapidly due to ongoing discoveries of genes associated with disease. Students participate in two clinical practicum experiences – one at the sophomore level and another at the senior level. The students have two options for the sophomore practicum experience. One option is to complete a 5-week practicum in the UP Health System-Marquette Cytogenetics/Molecular Pathology laboratory. The second option is to earn an Associate of Applied Science degree and Clinical Laboratory Technician (CLT) certification at the end of their sophomore year by completing a 6 month (24 week), full-time clinical practicum in an affiliated hospital laboratory. The senior practicum is conducted at UP Health System – Marquette, Michigan, and the Mayo Clinic in Rochester, Minnesota, or the Marshfield Clinic in Marshfield, Wisconsin.

Goal: To prepare qualified Medical Laboratory specialists to function effectively in a full service medical genetics laboratory.

Diagnostic Genetic Competencies

1. Perform all procedures and tasks found in a full-service Molecular Biology or Cytogenetic laboratory consistent with expectations described in the NCA examination guidelines and the National Accrediting Agency for Clinical Laboratory Sciences.
2. Interpret and record results which include:
   - evaluation of results
   - determine significance of results and the need for further testing
   - quantitate results as needed
   - correlate results with other lab results and/or clinical information
3. Perform and evaluate proper QA procedures including: statistical analysis, troubleshooting procedures, and proper handling of specimens.
4. Assure laboratory safety.
5. Define and/or identify principles of the procedures performed.
6. Appraise instrumentation/methodology for suitability of analysis.
7. Use basic principles of management in regards to planning, organizing staff and work flow, maintaining inventory and equipment, participate in on-site laboratory inspections, participate in proficiency testing and teaching, etc.
8. Demonstrate an understanding of current issues facing the profession and an understanding of their role and responsibilities as a member of the health care team.
9. Compete effectively in the job market.
10. Demonstrate an adequate knowledge base as defined by the professional organization and certification agency.

Concentration: Anatomic Pathology

Students in this concentration will earn clinical certification as a histotechnologist or cytotechnologist. Graduates work closely with pathologists in anatomic pathology departments of hospitals or clinics. Cytotechnologists (not to be confused with cytogeneticists), prepare cellular samples (such as those from PAP smears and biopsies) for study under the microscope and assist in the diagnosis of disease by
the examination of these samples. 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 cytotechnology or 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 cytotechnology or 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 Cytotechnology or 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 cytotechnology or 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: Science Technologist

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 three tracks that offer different options for students in this concentration: CLT/MLT Certification track; Forensics; 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, Diagnostic Genetics with CLT track)
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 Diagnostic Genetics Students: Students must earn a minimum GPA of 3.0 in selected required courses and NMU/cumulative GPA as described:

For Science Technology 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, Diagnostic Genetics, 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.*
After the sophomore practicum (CLS 250T, 251-254), 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. For students in the Diagnostic Genetics concentration a minimum GPA of 3.0 in selected required courses and an NMU/cumulative GPA is required. 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 Diagnostic Genetics (DG) Concentration:** Students can choose either a cytogenetics (CG) track or a molecular biology (MB) track. These two tracks have different clinical practicum experiences. For cytogenetics the relevant courses are: 250G, 460, 461, 462, 463. For molecular biology the practicum courses are 250G, 470, 471, 472, 473. The senior practicum begins in June-July or January each running for a total of 24 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.

Students completing a CG practicum or MB practicum need to speak with the Program Director regarding practicum application requirements and deadlines.

**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 Applicants with Regard to CLS Practicum Placement
(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:

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

1. NMU GPA

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

Post Sophomore Practicum CLS GPA:

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

Science GPA:

- \(<1.99 = 0\)
- \((\text{Chem, Bio, Physics}) 2.0 - 2.49 = 0.25\)
- \(2.5 - 2.99 = 0.50\)
- \(3.0 - 3.49 = 0.75\)
- \(3.5 - 4.00 = 1.0\)

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)

- \(<399 = 0\)
- \(400 - 499 = 0.25\)
- \(500 - 549 = 0.50\)
- \(550 - 599 = 0.75\)
- \(600 \& \text{ over} = 1.0\)

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.
Diagnostic Genetics
Criteria for Ranking Applicants for the DG Concentration
(Maximum of 4 points)

1. NMU GPA
   - < 2.6 = 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

2. GPA in the selected required courses
   - < 2.8 = 0
   - 2.8 - 2.99 = 0.25
   - 3.0 - 3.29 = 0.50
   - 3.3 - 3.59 = 0.75
   - 3.6 - 4.00 = 1.0

3. Recommendations from Sophomore Practicum or Evaluation from Partial Practicum
   - Average score of 6.0 – 6.99 = 0
   - Average score of 7.0 – 7.99 = 0.25
   - Average score of 8.0 – 8.99 = 0.50
   - Average score of 9.0 – 9.99 = 0.75
   - Average score of 10 = 1.0

4. Lab Work Experiences and/or Clinical Laboratory Certification
   - No experience or score < 400 = 0
   - Very limited experience or score 400-499 = 0.25
   - Three months or part-time experience or score 500-549 = 0.50
   - Six months of lab work experience or score 550-599 = 0.75
   - Full-time experience of ≥ six months or a score of ≥ 600 = 1.0
   - over = 1.0

If an applicant has both experience and certification then the two scores will be averaged.
# CLT to CLS Career Ladder Curriculum

## CLS: MEDICAL LABORATORY SCIENCE

### Phase 1 CLT

<table>
<thead>
<tr>
<th>SEMESTER 1 (Fall)</th>
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<tbody>
<tr>
<td>BI 104</td>
<td>Human Anatomy and Physiology (F,W)</td>
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<td>OR BI 207</td>
<td>Human Anatomy and Physiology (F,W)</td>
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<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
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<tr>
<td>CH 111</td>
<td>General Chemistry I (F,W,S: MA 111 or C- or higher in 100)</td>
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<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
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<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
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<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F) or CLS 200 (W)</td>
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<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
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<tr>
<td>CLS 201</td>
<td>Clin. Hematology/Coagulation (W: CLS109,190, or BI104)</td>
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<tr>
<td>CLS 203</td>
<td>Immunohematology (W)</td>
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<tr>
<td>CH 112</td>
<td>General Chemistry (F,W,S: C- or higher in CH 111)</td>
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<tr>
<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
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<tr>
<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
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<tr>
<th>SEMESTER 3 (Fall)</th>
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<tbody>
<tr>
<td>CLS 202</td>
<td>Clinical Chemistry (F)</td>
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<tr>
<td>CLS 204</td>
<td>Clinical Microbiology (F)</td>
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<tr>
<td>CLS 214</td>
<td>Diagnostic Microbiology (F)</td>
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<tr>
<td>BI 111</td>
<td>Intro to Biology: Principles (F,W)</td>
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<tr>
<td>*SOCR</td>
<td>Social Responsibility in a Diverse World</td>
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<th>SEMESTER 4 (Winter or Fall) (Sophomore Practicum = 6 months)</th>
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<tr>
<td>(Sophomore Practicum = 6 months) (January-August or July-December Practicum)</td>
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<tr>
<td>CLS 251</td>
<td>Clinical Hematology Practicum</td>
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<tr>
<td>CLS 252</td>
<td>Clinical Chemistry Practicum</td>
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<tr>
<td>CLS 253</td>
<td>Blood Banking Practicum</td>
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<tr>
<td>CLS 254</td>
<td>Clinical Microbiology Practicum</td>
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<tbody>
<tr>
<td>CLS 250T</td>
<td>Clinical Practice</td>
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Associate Degree Awarded

Eligible for MLT (ASCP) certification
### SEMESTER 5 (Fall)

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MA 109</td>
<td>Probability and Statistics (F, W, S: C- or higher in MA 100)</td>
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<tr>
<td>BI 218</td>
<td>Cell &amp; Molecular Bio. (F, W: BI 111, CH 105/107 or CH 111/112)</td>
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<td>*INTT</td>
<td>Integrative Thinking Elective</td>
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<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F, W: CH 111/112)</td>
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**Total Credits:** 16-17

### SEMESTER 6 (Winter)

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<tr>
<td>CLS 313</td>
<td>Intro. to Clinical Research (F, W, S: BI 207/208 or 104 Jr. standing)</td>
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<tr>
<td>CLS 401</td>
<td>Hematopathology (W: CLS 201, rec 251)</td>
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<tr>
<td>CLS 410</td>
<td>Clinical Management (F, W, S)</td>
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<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F, W, S: Jr. standing)</td>
<td>1</td>
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<tr>
<td>BI 405</td>
<td>Immunology (W: BI 203 or 303 or CLS 203 or 213 &amp; CH 220 or 322)</td>
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<tr>
<td>CLS 416</td>
<td>Cyrogeneics and Mol. Diag. (W: BI 312, CLS 436, or CH 450)</td>
<td>3 way option... 3-4</td>
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<tr>
<td>CH 450</td>
<td>Biochemistry (F, W: CH 220 or Jr. standing)</td>
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<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
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**Total Credits:** 14-15

### SEMESTER 7 (Fall)

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<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
<td>4</td>
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<tr>
<td>CLS 402</td>
<td>Adv. Clinical Chemistry (F: CLS 202, rec 252)</td>
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<td>CLS 404</td>
<td>Adv. Clinical Microbiology (F: CLS 204 &amp; 214, rec 254)</td>
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<tr>
<td>PERS</td>
<td>Perspectives on Society Elective (World Cultures?)</td>
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**Total Credits:** 16

### SEMESTER 8 (Winter or Fall) (Senior Practicum = 5 months)

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<td>Advanced Clinical Chemistry Practicum</td>
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**Total Credits:** 14

### SUMMER SESSION

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<td>Clinical Practice</td>
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**Total Credits Required for Graduation:** 126

**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 2019
**Name:**

**NMUIN:**

**Major:** Clinical Laboratory Science

**Concentration:** Laboratory Medicine

**Adviser:** Bulletin Year: 2019-2020

**Date of Last ACAC Audit or Contact:**

---

### 126 TOTAL CREDITS REQUIRED FOR DEGREE

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<thead>
<tr>
<th>Quantitative Reasoning and Analysis Component (One Course Required)</th>
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<tr>
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**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

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<td>EN 211</td>
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<td>CLS 203</td>
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<td>CH 112</td>
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<td>CLS 200</td>
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<td>CLS 213</td>
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<td>CLS 202</td>
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<td>CLS 204</td>
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<td>CLS 214</td>
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<td>BI 111</td>
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<td>*SOCR</td>
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<th>SEMESTER 4 (Winter or Fall) (Sophomore Practicum = 6 months)</th>
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<td>CLS 252 Clinical Chemistry Practicum</td>
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<td>CLS 253 Blood Banking Practicum</td>
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<td>CLS 254 Clinical Microbiology Practicum</td>
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<tr>
<td>CLS 250T Clinical Practice</td>
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Associate Degree Awarded

Eligible for MLT (ASCP) certification
## CLS: MICROBIOLOGY CONCENTRATION
### Phase 2 CLS

### SEMESTER 5 (Fall)
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<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
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<td>Cell &amp; Molecular Bio (F,W: BI 111,CH 105/107 or CH111/112)</td>
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<tr>
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<td>Integrative Thinking Elective</td>
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<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F: CH 111/112)</td>
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### SEMESTER 6 (Winter)
<table>
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<tr>
<td>CLS 313</td>
<td>Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)</td>
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<td>BI 405</td>
<td>Immunology (W: BI 203 or 303 or CLS 203 or 213 &amp; CH 220 or 322)</td>
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<tr>
<td>BI 303</td>
<td>General Microbiology or <strong>BI 404</strong> (W: CLS 204/214)</td>
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<tr>
<td>BI 423</td>
<td>Parasitology (W: CLS 204/214)</td>
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<td>HUME</td>
<td>Human Expression Science (World Cultures?)</td>
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### SEMESTER 7 (Fall)
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<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
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<td>CLS 404</td>
<td>Adv Clinical Microbiology (F: CLS 204 &amp; 214 rec 254)</td>
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<td>CLS 410</td>
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<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr standing)</td>
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<td>BI 404</td>
<td>Virology (F, odd years, CLS 204/214 &amp; CH 220) or <strong>BI 303</strong></td>
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### SEMESTER 8 (Winter or Fall) (Senior Practicum = 5 months)
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<td>CLS 441</td>
<td>Advanced Clinical Mycology</td>
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<tr>
<td>CLS 442</td>
<td>Advanced Clinical Parasitology</td>
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<tr>
<td>CLS 443</td>
<td>Advanced Clinical Microbacteriology/Virology</td>
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### SUMMER SESSION
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<tbody>
<tr>
<td>CLS 250M</td>
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**TOTAL CREDITS REQUIRED FOR GRADUATION** .................................................. 125

**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 2019
# DIAGNOSTIC GENETICS
## MOLECULAR BIOLOGY or CYTOGENETICS without CLT

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<th>Required Courses</th>
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<td>BI 104 or BI 207</td>
<td>Human Anatomy and Physiology (F,W)</td>
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<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
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<tr>
<td>CH 111</td>
<td>General Chemistry I (F,W,S:MA 111 or C- or higher in 100)</td>
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<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
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<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
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<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F)</td>
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<td>BI 111</td>
<td>Intro to Biology: Principles (F,W)</td>
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<td>CLS 201</td>
<td>Clin. Hematology/Coagulation (W: CLS109,190)</td>
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<td>CLS 203</td>
<td>Immunohematology (W)</td>
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<td>General Chemistry (F,W,S: C- or higher in CH 111)</td>
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<td>CLS 204</td>
<td>Clinical Microbiology (F)</td>
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<td>Cell &amp; Molecular Bio. (F,W:BI 111,CH 105 or CH 111/112)</td>
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<td>Introduction to Organic Chemistry (F: CH 111/112)</td>
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<td>BI 312</td>
<td>Genetics (W:BI 218)</td>
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<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
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<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
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<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
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<td>Integrative Thinking Elective</td>
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<td>CH 450</td>
<td>Biochemistry (F,W)</td>
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<td>Medical Genetics (F: BI 218 or BI 312)</td>
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# DIAGNOSTIC GENETICS
MOLECULAR BIOLOGY or CYTOGENETICS without CLT

## SEMESTER 6 (Winter)
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<td>Intro. to Clinical Research (W: BI 207/208 or 104 Jr. standing)</td>
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<td>CLS 410</td>
<td>Clinical Management (F)</td>
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<tr>
<td>BI 405</td>
<td>Immunology or BI 404 (F) or BI 419 (odd F: BI 312, CH 450 or BI 406)</td>
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<tr>
<td>BI 416</td>
<td>Cytogenetics and Molecular Diagnostics (W)</td>
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<td>BI 406</td>
<td>Advanced Cell Biology (W: BI 111 and BI 218 or CH 450 and CH 220)</td>
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<td>Biochemical Techniques (W: CH 450)</td>
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## SUMMER
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<td>Summer Practicum</td>
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## SEMESTER 7 (Fall)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
<td>3-4</td>
</tr>
<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr.standing)</td>
<td>1</td>
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<tr>
<td>BI 418</td>
<td>Molecular Biology (F, BI 312 and CH 220; CH 450)</td>
<td>4</td>
</tr>
<tr>
<td>*PERS</td>
<td>Perspectives on Social Elective (World Cultures?)</td>
<td>4</td>
</tr>
<tr>
<td>BI 404</td>
<td>Virology or BI 419 (odd F: BI 312, CH 450 or BI 406) or BI 405 (W)</td>
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</table>

## SEMESTER 8 (Winter or Fall) CYTOGENETICS
Senior Practicum
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 460</td>
<td>Spec. Proc and Culture</td>
<td>4</td>
</tr>
<tr>
<td>CLS 461</td>
<td>Microscopic Analysis</td>
<td>4</td>
</tr>
<tr>
<td>CLS 462</td>
<td>FISH Technology</td>
<td>3</td>
</tr>
<tr>
<td>CLS 463</td>
<td>CG Special Tech. Projects</td>
<td>3</td>
</tr>
<tr>
<td>CLS 250G</td>
<td>Clinical Practice</td>
<td>2</td>
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</table>

## SEMESTER 8 (Winter or Fall) MOLECULAR DIAGNOSTICS
Senior Practicum
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 470</td>
<td>DNA Purification</td>
<td>2</td>
</tr>
<tr>
<td>CLS 471</td>
<td>Genetic and Genomic Analysis Techniques</td>
<td>2</td>
</tr>
<tr>
<td>CLS 472</td>
<td>PCR Analysis</td>
<td>5</td>
</tr>
<tr>
<td>CLS 473</td>
<td>MB Special Techniques Projects</td>
<td>5</td>
</tr>
<tr>
<td>CLS 250G</td>
<td>Clinical Practice</td>
<td>2</td>
</tr>
</tbody>
</table>

## TOTAL CREDITS REQUIRED FOR GRADUATION
123

NMU/cumulative GPA and GPA required in selected courses of 3.0 required

### 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 2019
# CLT to CLS Career Ladder Curriculum

**DIAGNOSTIC GENETICS**

**MOLECULAR BIOLOGY or CYTOGENETICS with CLT**

## Phase 1 CLT

### Semester 1 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BI 104 or BI 207</td>
<td>Human Anatomy and Physiology (F,W) or Human Anatomy and Physiology 1 (F,W)</td>
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<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
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<tr>
<td>CH 111</td>
<td>General Chemistry I (F,W,S: MA 111 or C- or higher in 100)</td>
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<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
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<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F)</td>
<td>1</td>
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### Semester 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
<td>4</td>
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<tr>
<td>CLS 201</td>
<td>Clin. Hematology/Coagulation (W: CLS109,190)</td>
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<tr>
<td>CLS 203</td>
<td>Immunohematology (W)</td>
<td>3</td>
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<tr>
<td>CH 112</td>
<td>General Chemistry (F,W,S: C- or higher in CH 111)</td>
<td>5</td>
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<tr>
<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
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<tr>
<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
<td>1</td>
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### Semester 3 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 202</td>
<td>Clinical Chemistry (F)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 204</td>
<td>Clinical Microbiology (F)</td>
<td>2</td>
</tr>
<tr>
<td>CLS 214</td>
<td>Diagnostic Microbiology (F)</td>
<td>3</td>
</tr>
<tr>
<td>BI 111</td>
<td>Intro to Biology: Principles (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>*SOCR</td>
<td>Social Responsibility in a Diverse World</td>
<td>3-4</td>
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</table>

### Semester 4 (Winter or Fall) (Sophomore Practicum = 6 months)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 251</td>
<td>Clinical Hematology Practicum</td>
<td>3</td>
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<tr>
<td>CLS 252</td>
<td>Clinical Chemistry Practicum</td>
<td>4</td>
</tr>
<tr>
<td>CLS 253</td>
<td>Blood Banking Practicum</td>
<td>3</td>
</tr>
<tr>
<td>CLS 254</td>
<td>Clinical Microbiology Practicum</td>
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### Summer Session

<table>
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<tbody>
<tr>
<td>CLS 250T</td>
<td>Clinical Practice</td>
<td>2</td>
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</table>

Associate Degree Awarded Eligible for MLT (ASCP) certification

**Applied Workplace Leadership Minor Courses**

*LDR 200 Ethical Leadership in the Workplace (4) – PERS*  
*LDR 300 Leadership in Diverse Workplaces (4) – SOCR*  
*LDR 400 Systems Thinking in Workplace Leadership (4) – INTT*

LDR 100 Effective Communication in the Workplace (4)  
LDR 220 Assessment in the Workplace (4)
# DIAGNOSTIC GENETICS

**MOLECULAR BIOLOGY or CYTOGENETICS with CLT**

## Phase 2 CLS

### SEMESTER 5 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MA 109</td>
<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
<td>4</td>
</tr>
<tr>
<td>BI 218</td>
<td>Cell &amp; Molecular Bio. (F,W:BI 111,CH 105 or CH 111/112)</td>
<td>4</td>
</tr>
<tr>
<td>*INTT</td>
<td>Integrative Thinking Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F: CH 11/112)</td>
<td>5</td>
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### SEMESTER 6 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BI 312</td>
<td>Genetics (W:BI 218)</td>
<td>4</td>
</tr>
<tr>
<td>CH 450</td>
<td>Biochemistry (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
<td>3-4</td>
</tr>
<tr>
<td>*PERS</td>
<td>Perspectives on Social Elective (World Cultures?)</td>
<td>4</td>
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</tbody>
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### SEMESTER 7 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr. standing)</td>
<td>1</td>
</tr>
<tr>
<td>BI 404</td>
<td>Virology or <strong>BI 405</strong> (W)<strong>BI 419</strong> (odd F: BI 312, CH 450 or BI 406)</td>
<td>3-4</td>
</tr>
<tr>
<td>BI 418</td>
<td>Molecular Biology (F)</td>
<td>4</td>
</tr>
<tr>
<td>PERS</td>
<td>Perspectives on Social Elective</td>
<td>4</td>
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### SEMESTER 8 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BI 406</td>
<td>Advanced Cell Biology (W: BI 111 and BI 218 or CH 450 and CH 220)</td>
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</tr>
<tr>
<td>CH 454</td>
<td>Biochemical Techniques (W: CH 450)</td>
<td>4</td>
</tr>
<tr>
<td>BI 405</td>
<td>Immunology or <strong>BI 404</strong> (F) or <strong>BI 419</strong> (odd F)</td>
<td>3-4</td>
</tr>
<tr>
<td>CLS 313</td>
<td>Intro. to Clinical Research (W: BI 207/208 or 104 Jr. standing)</td>
<td>1</td>
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<tr>
<td>CLS 410</td>
<td>Clinical Management (F)</td>
<td>1</td>
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<tr>
<td>CLS 416</td>
<td>Cytogenetics and Molecular Diagnostics (W)</td>
<td>3</td>
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### SEMESTER 9 (Winter or Fall)

**MOLECULAR DIAGNOSTICS** Senior Practicum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 470</td>
<td>DNA Purification</td>
<td>2</td>
</tr>
<tr>
<td>CLS 471</td>
<td>Genetic and Genomic Analysis Techniques</td>
<td>2</td>
</tr>
<tr>
<td>CLS 472</td>
<td>PCR Analysis</td>
<td>5</td>
</tr>
<tr>
<td>CLS 473</td>
<td>MB Special Techniques Projects</td>
<td>5</td>
</tr>
<tr>
<td>CLS 250G</td>
<td>Clinical Practice</td>
<td>2</td>
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</table>

**CYTOGENETICS** Senior Practicum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 460</td>
<td>Spec. Proc and Culture</td>
<td>4</td>
</tr>
<tr>
<td>CLS 461</td>
<td>Microscopic Analysis</td>
<td>4</td>
</tr>
<tr>
<td>CLS 462</td>
<td>FISH Technology</td>
<td>3</td>
</tr>
<tr>
<td>CLS 463</td>
<td>CG Special Tech. Projects</td>
<td>3</td>
</tr>
<tr>
<td>CLS 250G</td>
<td>Clinical Practice</td>
<td>2</td>
</tr>
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</table>

### TOTAL CREDITS REQUIRED FOR GRADUATION

138

NMU/cumulative GPA and GPA required in selected courses of 3.0 is required

BS Degree Awarded

Eligible for MLS (ASCP) certification

Fall 2019
### Selected Required Courses for Diagnostic Genetics Practicum

**Track:**

<table>
<thead>
<tr>
<th>Courses in the Major</th>
<th>Grade</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>CLS 100 Obtaining a Blood Specimen - 1</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>CLS 109 Introduction to Diagnostic Sciences - 1</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>CLS 190 Microscopy and Lab Techniques - 1</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>CLS 201 Clinical Hematology and Coagulation - 3</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>CLS 204 Clinical Microbiology - 2</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>CLS 213 Clinical Immunology/Serology - 1</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>CLS Practicum - 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLS 250T and CLS 391</td>
<td></td>
<td>S/B-</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
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<tr>
<td>CLS 250T and CLS 251</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>CLS 313 Intro to Research - 1</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>CLS 410 Clinical Management - 1</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>CLS 420 Clinical Education Practices - 1</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>CLS 436 Medical Genetics - 4</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>BI 218 Cell and Molecular Biology - 4</td>
<td></td>
<td>B-</td>
</tr>
<tr>
<td>BI 312 Genetics - 4</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>BI 406 Cell Biology - 4</td>
<td></td>
<td>(CY) B</td>
</tr>
<tr>
<td>CLS 416 Cytogenetics and Molecular Diagnostics - 3</td>
<td></td>
<td>(CY) B</td>
</tr>
<tr>
<td>BI 418 Molecular Biology - 4</td>
<td></td>
<td>(MB) B</td>
</tr>
<tr>
<td>CH 454 Biochemical Techniques - 4</td>
<td></td>
<td>(MB) B</td>
</tr>
</tbody>
</table>

**GPA of Selected Required Courses and Overall GPA**

| GPA of Selected Required Courses and Overall GPA | 3.0 |

**Faculty Comments:**

**Effective Fall 2016**

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**Associate Dean and Director, Clinical Sciences**
# CLT to CLS Career Ladder Curriculum

**CLS: CLINICAL SYSTEMS ANALYST CONCENTRATION**

## Phase 1 CLT

### SEMESTER 1 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BI 104 OR</td>
<td>Human Anatomy and Physiology OR Human Anat &amp; Phys I (F,W:</td>
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<tr>
<td>BI 207</td>
<td>Concurrently CH 105, CH 107 or CH 111)</td>
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<tr>
<td>EN 111</td>
<td>College Composition I</td>
<td>4</td>
</tr>
<tr>
<td>CH</td>
<td>Chemistry (above 100)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen</td>
<td>1</td>
</tr>
<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy and Lab Techniques</td>
<td>1</td>
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### SEMESTER 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CLS 201</td>
<td>Clinical Hematology/Coagulation</td>
<td>3</td>
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<tr>
<td>CLS 203</td>
<td>Immunohematology</td>
<td>3</td>
</tr>
<tr>
<td>CH</td>
<td>Chemistry (above 100)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 200</td>
<td>Urine and Body Fluid Analysis</td>
<td>1</td>
</tr>
<tr>
<td>CLS 213</td>
<td>Clinical Immunology and Serology</td>
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<tr>
<td>CIS 100</td>
<td>Computer Concepts</td>
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### SEMESTER 3 (Fall)

<table>
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CLS 202</td>
<td>Clinical Chemistry</td>
<td>4</td>
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<tr>
<td>CLS 204</td>
<td>Clinical Microbiology</td>
<td>2</td>
</tr>
<tr>
<td>CLS 214</td>
<td>Diagnostic Microbiology</td>
<td>3</td>
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<tr>
<td>*SOCR</td>
<td>Social Responsibility in a Diverse World</td>
<td>3-4</td>
</tr>
<tr>
<td>EN 211</td>
<td>English Composition II</td>
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### SEMESTER 4 (Winter) (Sophomore Practicum = 6 months)

<table>
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<th>Course Code</th>
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<tr>
<td>CLS 251</td>
<td>Clinical Hematology Practicum</td>
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<tr>
<td>CLS 252</td>
<td>Clinical Chemistry Practicum</td>
<td>4</td>
</tr>
<tr>
<td>CLS 253</td>
<td>Blood Banking Practicum</td>
<td>3</td>
</tr>
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<td>CLS 254</td>
<td>Clinical Microbiology Practicum</td>
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### SUMMER SESSION

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 250T</td>
<td>Clinical Practice</td>
<td>2</td>
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</tbody>
</table>

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 **CIS 112/212** 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 **CIS 491** 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

Fall 2019
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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MA 109</td>
<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
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<tr>
<td>CLS 313</td>
<td>Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)</td>
<td>1</td>
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<tr>
<td>BI 405</td>
<td>Immuno (W: BI 203 or 303 or CLS 203 or 213, and CH 220 or 322)</td>
<td>3</td>
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<tr>
<td>PERS</td>
<td>Perspectives on Social Elective</td>
<td>4</td>
</tr>
<tr>
<td>*CH 450 or</td>
<td>Biochemistry I (F,W: CH220, Jr standing or IP) or Adv Cell (W: BI 111 and BI 218 or CH450, Jr standing or IP)</td>
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</tr>
<tr>
<td>BI 406</td>
<td></td>
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</table>

*Histotechnology should enroll in CH 450; Cytotechnology should enroll in BI 406 (BI 111 and BI 218 or CH 220 and CH 450)

### Cytotechnology Option:

### SEMESTER 7 (Fall) Clinical Practicum

Must complete a one-year Cytotechnology program at an affiliated Hospital

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CLS 480</td>
<td>Cytology Orientation</td>
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<tr>
<td>CLS 481</td>
<td>Tissue Cytology I</td>
<td>8</td>
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<tr>
<td>CLS 482</td>
<td>Tissue Cytology II</td>
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### SEMESTER (Winter) Practicum continued

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<tr>
<td>CLS 483</td>
<td>Tissue Cytology III</td>
<td>8</td>
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<tr>
<td>CLS 484</td>
<td>Applied Clin Practicum</td>
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<tr>
<td>CLS 485</td>
<td>Adv Cytology Tech</td>
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Summer, Continued Practicum

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<th>Course Title</th>
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<tbody>
<tr>
<td>CLS 250C</td>
<td>Clinical Practice</td>
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### TOTAL CREDITS REQUIRED FOR DEGREE

127

### Histotechnology Option:

### SEMESTER 7 (Fall) Clinical Practicum

Must complete a one-year Histotechnology program at an affiliated Hospital

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 380</td>
<td>Histotechniques I</td>
<td>7</td>
</tr>
<tr>
<td>CLS 381</td>
<td>Histotechniques II</td>
<td>7</td>
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### SEMESTER (Winter) Practicum Continued

<table>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 382</td>
<td>Histotechniques III</td>
<td>3</td>
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<tr>
<td>CLS 383</td>
<td>Histochemistry and Pathology</td>
<td>8</td>
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<tr>
<td>CLS 384</td>
<td>Adv Histology</td>
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Summer, Continued Practicum

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<tbody>
<tr>
<td>CLS 250H</td>
<td>Clinical Practice</td>
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</table>

### TOTAL CREDITS REQUIRED FOR DEGREE

125

NMU/cumulative GPA of 2.6 required

BS Degree Awarded Eligible for MLS (ASCP) certification

Fall 2019
# CLT to CLS Career Ladder Curriculum

**CLS: CONCENTRATION: SCIENCE TECHNOLOGIST: CLT TRACK**

## Phase 1 CLT

### SEMESTER 1 (Fall)

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>Obtaining a Blood Specimen (F,W)</td>
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<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F)</td>
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</tr>
<tr>
<td>BI 104 or</td>
<td>Human Anatomy and Physiology (F,W) or Human Anatomy and Physiology I (F,W)</td>
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<tr>
<td>CH 111</td>
<td>General Chemistry I (F,W,S:MA 111 or C- or higher in 100)</td>
<td>5</td>
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<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
<td>4</td>
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### SEMESTER 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 201</td>
<td>Clin Hematology/Coag (W: CLS109,190, or BI 104)</td>
<td>3</td>
</tr>
<tr>
<td>CLS 203</td>
<td>Immunohematology (W)</td>
<td>3</td>
</tr>
<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
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<tr>
<td>CH 112</td>
<td>General Chemistry (F,W,S: C- or higher in CH 111)</td>
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<tr>
<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
<td>1</td>
</tr>
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### SEMESTER 3 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>*SOCR</td>
<td>Social Responsibility in a Diverse World</td>
<td>4</td>
</tr>
<tr>
<td>CLS 202</td>
<td>Clinical Chemistry (F)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 204</td>
<td>Clinical Microbiology (F: CLS 109, BI 104 or BI 208)</td>
<td>2</td>
</tr>
<tr>
<td>CLS 214</td>
<td>Diagnostic Microbiology (F: CLS 204 or concurrent)</td>
<td>3</td>
</tr>
<tr>
<td>BI 111</td>
<td>Intro to Biology: Principles (F,W)</td>
<td>4</td>
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### SEMESTER 4 (Winter) (Sophomore Practicum = 6 months)

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 251</td>
<td>Clinical Hematology Practicum</td>
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</tr>
<tr>
<td>CLS 252</td>
<td>Clinical Chemistry Practicum</td>
<td>4</td>
</tr>
<tr>
<td>CLS 253</td>
<td>Blood Banking Practicum</td>
<td>3</td>
</tr>
<tr>
<td>CLS 254</td>
<td>Clinical Microbiology Practicum</td>
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### SUMMER SESSION

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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CLS 250T</td>
<td>Clinical Practice</td>
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Associate Degree Awarded

Eligible for MLT (ASCP) certification
## CLS: CONCENTRATION: SCIENCE TECHNOLOGIST: CLT TRACK
### PHASE 2 CLS

#### SEMESTER 5 (Fall)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MA 109</td>
<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 402</td>
<td>Adv Clin Chem (F: CLS 202)</td>
<td>2</td>
</tr>
<tr>
<td>BI 218</td>
<td>Cell &amp; Molecular Bio (F,W: BI 111, CH 105 or CH 111/112)</td>
<td>4</td>
</tr>
<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F: CH 111/112)</td>
<td>5</td>
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#### SEMESTER 6 (Winter)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CH 450</td>
<td>Biochemistry (F,W) or BI 406 Adv Cell (W)</td>
<td>4</td>
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<tr>
<td>*INTT</td>
<td>Integrative Thinking Elective</td>
<td>4</td>
</tr>
<tr>
<td>*PERS</td>
<td>Perspectives on Society Elective</td>
<td>4</td>
</tr>
</tbody>
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#### SEMESTER 7 (Fall)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr standing)</td>
<td>1</td>
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<tr>
<td>CLS 410</td>
<td>Clinical Management (F)</td>
<td>1</td>
</tr>
<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
<td>4</td>
</tr>
<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
<td>4</td>
</tr>
<tr>
<td>PH 201</td>
<td>Physics (F,W,S)</td>
<td>5</td>
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#### SEMESTER 8 (Winter)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 416</td>
<td>Cytogen Mol Diag (W: BI 312 or CLS 436 or CH 450)</td>
<td>3</td>
</tr>
<tr>
<td>CLS 313</td>
<td>Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)</td>
<td>1</td>
</tr>
<tr>
<td>*PERS</td>
<td>Perspectives on Society Elective (World Cultures?)</td>
<td>4</td>
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</table>

### TOTAL CREDITS REQUIRED FOR DEGREE
- 120

**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

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*Fall 2019*
# CLS: SCIENCE TECHNOLOGIST: FORENSICS TRACK

## SEMESTER 1 (Fall)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
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<tbody>
<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
<td>4</td>
</tr>
<tr>
<td>CH 111</td>
<td>General Chemistry I (F,W,S; MA 111 or C- or higher in 100)</td>
<td>5</td>
</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 109</td>
<td>Intro to Diagnostic Sciences (F,W)</td>
<td>1</td>
</tr>
<tr>
<td>CLS 190</td>
<td>Microscopy &amp; Lab Techniques (F)</td>
<td>1</td>
</tr>
<tr>
<td>BI 104</td>
<td>Human Anatomy and Physiology (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>BI 207</td>
<td>Human Anatomy and Physiology I (F,W)</td>
<td>4</td>
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## SEMESTER 2 (Winter)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
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<tbody>
<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
<td>4</td>
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<tr>
<td>CLS 201</td>
<td>Clin Hematology/Coag (W: CLS109,190, or BI 104)</td>
<td>3</td>
</tr>
<tr>
<td>CLS 203</td>
<td>Immunohematology (W)</td>
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</tr>
<tr>
<td>CH 112</td>
<td>General Chemistry (F,W,S: C- or higher in CH 111)</td>
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<td>CLS 200</td>
<td>Urine and Body Fluid Analysis (W)</td>
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<tr>
<td>CLS 213</td>
<td>Clinical Immunology &amp; Serology (W)</td>
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## SEMESTER 3 (Fall)

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<th>Course</th>
<th>Description</th>
<th>Units</th>
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<tr>
<td>CLS 202</td>
<td>Clinical Chemistry (F)</td>
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<tr>
<td>CLS 204</td>
<td>Clinical Microbiology (F: CLS 109 or BI 104)</td>
<td>2</td>
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<td>CLS 214</td>
<td>Diagnostic Microbiology (F: CLS 204 or concurrent)</td>
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<tr>
<td>BI 111</td>
<td>Intro to Biology: Principles (F,W)</td>
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## SEMESTER 4 (Winter)

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<th>Course</th>
<th>Description</th>
<th>Units</th>
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<tbody>
<tr>
<td>CJ 110</td>
<td>Intro to Criminal Justice (F,W,S)</td>
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<tr>
<td>*SOCR</td>
<td>Social Responsibility in a Diverse World</td>
<td>4</td>
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<tr>
<td>MA 109</td>
<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
<td>4</td>
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<tr>
<td>BI 218</td>
<td>Cell &amp; Molecular Bio (F,W: BI 111, CH 105 or CH 111/112)</td>
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## CLS: SCIENCE TECHNOLOGIST: FORENSICS TRACK

### SEMESTER 5 (Fall)

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<tr>
<td>*INTT</td>
<td>Integrative Thinking Elective</td>
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<tr>
<td>CLS 402</td>
<td>Adv Clin Chem (F: CLS 202)</td>
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<tr>
<td>CJ</td>
<td>Elective</td>
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<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F: CH 111/112)</td>
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### SEMESTER 6 (Winter)

<table>
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<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CH 450</td>
<td>Biochemistry (F,W) or BI 406 Adv Cell (W)</td>
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<td>PERS</td>
<td>Perspectives on Social Elective (World Cultures?)</td>
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<tr>
<td>CJ</td>
<td>Elective</td>
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<td></td>
<td>General Elective (Recommend BI 312)</td>
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### SEMESTER 7 (Fall)

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<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BI 418</td>
<td>Mol Bio (F: BI 312 and CH 220 or CH 322, + CH 450-cone)</td>
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<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
<td>4</td>
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<tr>
<td>PH 201</td>
<td>Physics (F,W,S)</td>
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<td>CLS 410</td>
<td>Clinical Management (F)</td>
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<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr standing)</td>
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### SEMESTER 8 (Winter)

<table>
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<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLS 416</td>
<td>Cytogen Mol Diag (W: BI 312 or CLS 436 or CH 450)</td>
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<tr>
<td>CLS 313</td>
<td>Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)</td>
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</tr>
<tr>
<td>*PERS</td>
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<td>4</td>
</tr>
<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
<td>4</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS REQUIRED FOR DEGREE**: 120

---

Note: Students need to complete 8 credits of Criminal Justice courses in addition to CJ 110.

### 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 2019*
### CLS: SCIENCE TECHNOLOGIST: BIOTECHNOLOGY TRACK

#### SEMESTER 1 (Fall)
- **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**  Intro to Diagnostic Sciences (F,W) .............................................. 1
- **CLS 109**  Obtaining a Blood Specimen (F,W) .............................................. 1
- **CLS 190**  Microscopy & Lab Techniques (F) .............................................. 1
- **BI 104** or **BI 207**  Human Anatomy and Physiology (F,W) or

#### SEMESTER 2 (Winter)
- **CLS 201**  Clin Hematology/Coag (W: CLS109,190, or BI 104) ..................... 3
- **CLS 203**  Immunohematology (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)
- **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)
- **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: SCIENCE TECHNOLOGIST: BIOTECHNOLOGY TRACK

#### SEMESTER 5 (Fall)

<table>
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<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CLS 402</td>
<td>Adv Clin Chem (F: CLS 202)</td>
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</tr>
<tr>
<td>PH 201</td>
<td>Physics (F,W,S)</td>
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</tr>
<tr>
<td>CH 220</td>
<td>Introduction to Organic Chemistry (F: CH 111/112)</td>
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<tr>
<td>BI 4XX</td>
<td>Biology*</td>
<td>3-4</td>
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#### SEMESTER 6 (Winter)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUME</td>
<td>Human Expression Elective (World Cultures?)</td>
</tr>
<tr>
<td>MA 109</td>
<td>Probability and Statistics (F,W,S: C- or higher in MA 100)</td>
</tr>
<tr>
<td>CH 450</td>
<td>Biochemistry (F,W) or BI 406 Adv Cell (W)</td>
</tr>
</tbody>
</table>

#### SEMESTER 7 (Fall)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 4XX</td>
<td>Biology*</td>
</tr>
<tr>
<td>BI 4XX</td>
<td>Biology*</td>
</tr>
<tr>
<td>CLS 436</td>
<td>Medical Genetics (F: BI 218 or BI 312)</td>
</tr>
</tbody>
</table>

#### SEMESTER 8 (Winter)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 313</td>
<td>Intro to Clinical Research (W: BI 207/208 or 104 Jr standing)</td>
</tr>
<tr>
<td>CLS 410</td>
<td>Clinical Management (F)</td>
</tr>
<tr>
<td>CLS 420</td>
<td>Clinical Educational Practices (F: Jr standing)</td>
</tr>
<tr>
<td>CLS 416</td>
<td>Cytogen Mol Diag (W: BI 312 or CLS 436 or CH 450)</td>
</tr>
<tr>
<td>PERS</td>
<td>Perspective on Social Elective (World Cultures? 300 level?)</td>
</tr>
<tr>
<td>BI 4XX</td>
<td>Biology*</td>
</tr>
</tbody>
</table>

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 (Thesis Only)….. 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
- **OR** 590 **OR** Capstone in Clinical Applications of Genetic & Genomic Technologies (1-4 cr)
- **OR** 599 **OR** 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.*
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)**
- CLS 520 Principle of Clinical Molecular Genetics 3
- CLS 563 Research Design and Methods 3

**SEMESTER 2 (Winter)**
- 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)**
- CLS 516* Clinical Molecular Diagnostic Laboratory *(Thesis Only)* 1
- CLS 543 Molecular Diagnostic in identity Testing 2
- CLS 544 Molecular Diagnosis of Infectious Disease 3

**SEMESTER 4 (Fall)**
- CLS 541 Clinical App of Genomic Medicine 3
- CLS 570 Method Verification and Validation 4

**SEMESTER 5 (Winter)**
- CLS 560 Biomedical Lab Operations 3
- CLS 580 Project in Molecular Genetics (1-4 cr) 4
- **OR** 590 OR Capstone in Clinical Applications of Genetic & Genomic Technologies (1-4 cr)
- **OR** 599 OR 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

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1 (Fall)</td>
<td>CLS 520</td>
<td>Principle of Clinical Molecular Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Semester 2 (Winter)</td>
<td>CLS 526</td>
<td>Clinical Molecular Diagnostic Techniques</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CLS 536</td>
<td>Clinical Genetics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ED 505</td>
<td>Measurement and Evaluation</td>
<td>2</td>
</tr>
<tr>
<td>Semester 3 (Spring/Summer)</td>
<td>ED 504</td>
<td>Psychology of Evaluation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CLS 544</td>
<td>Molecular Diagnosis of Infectious Disease</td>
<td>3</td>
</tr>
<tr>
<td>Semester 4 (Fall)</td>
<td>CLS 541</td>
<td>Clinical App of Genomic Medicine</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CLS 570</td>
<td>Method Verification and Validation</td>
<td>4</td>
</tr>
<tr>
<td>Semester 5 (Winter)</td>
<td>CLS 560</td>
<td>Biomedical Lab Operations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CLS 522</td>
<td>Curriculum Development</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CLS 580</td>
<td>Project in Clinical Molecular Genetics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

**Total Credits Required for Degree**: 33
Radiography Program
Radiography Program

MISSION STATEMENT
Northern Michigan University Radiography Program is dedicated to the education of entry-level radiographers. It is the intention of this program to promote radiographers that will function as proficient health care professionals possessing a constant concern for quality patient care, quality customer service and technical competency in a diverse healthcare population.

Our Philosophy: 
Our philosophy is to provide our students the highest quality of education with the most efficient use of our resources. The comprehensiveness of our academic offerings provides: opportunities for instruction to students from a broad range of ability levels and interests, placement of staff members and the radiography student in a one-on-one relationship of guidance and feedback during instruction, and adaptability to balance the evolution of diagnostic imaging in healthcare for personal and professional success.

Our Goals: 
Our goals are to develop students who will:
1. Administer effective communication skills.
2. Utilize critical thinking and problem solving skills in the performance of medical and imaging procedures.
3. Demonstrate competency in methods of patient care and radiographic imaging procedures.
4. Model professionalism and quality customer service.

Program Terminal Objectives: 
Upon completion the student will:
1. Practice oral, written, and electronic medical communication.
2. Demonstrate knowledge of human anatomy, physiology, and pathology.
3. Anticipate and provide patient care, safety, and comfort for a diverse population.
4. Apply the theories of Radiologic Sciences and Techniques.
5. Demonstrate the knowledge of medical ethics and legal issues.
6. Operate radiographic instrumentation and equipment.
7. Perform radiographic procedures modifying each to accommodate for patient diversity and/or situation.
9. Practice radiation protection for the patient, self and others.
10. Exercise independent judgment and discretion in the technical performance of diagnostic imaging procedures.
11. Promote life-long learning to allow for adaptation to an ever-changing environment.
ACCREDITATION
The Northern Michigan University Radiography Program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT).

For accreditation information contact the J.R.C.E.R.T.:

Joint Review Committee on Education in Radiologic Technology
20 N. Wacker Drive
Suite 2850
Chicago, Illinois  60606-2901
(312) 704-5300

Standards for Accreditation:
The Standards for an Accredited Educational Program in Radiologic Sciences adopted by the JRCERT is available for review by all students in the Radiography faculty offices. Accreditation Standards are discussed with all students at orientation.
Northern Michigan University Radiography Program seeks to admit students who can provide evidence of potential to succeed in the health care profession of Radiologic Sciences. Applicants who meet all entrance criteria will be fully considered on an individual basis for admission.

The admission process is completed in four parts. An applicant must meet all application requirements/deadlines from Part I and Part II to participate in Part III. Admittance into the program is finalized by Part IV completion of proof of immunizations and a criminal background check.

Student selection is based upon a point system for the following application criteria:
1. Letter of Introduction/Intent
2. Community Service/Healthcare Experience
3. Supportive Course Cumulative GPA
4. Interview

The top twenty cumulative scores representative of a good academic standing, motivation, dedication, adaptability, good interpersonal skills, and a discernible interest in others will be accepted into the program. In the event there are two or more applicants with the same point total, the highest student overall GPA will be used to break the tie.

**ADMISSION PROCESS:** January 1 – April 1

**Part I**
**Pre-requisite General Education Courses**
An applicant must:
1) Have the academic skills that will allow enrollment in college level general education courses such as College Composition and College Algebra. This may require testing through an Academic Skills Assessment Program (ASAP) administered by a college or university.
2) Complete all pre-requisite general educational courses with a cumulative GPA of 2.5 or above by May of the application year. A list of general education courses is located under Curriculum.
   a. BI 207 Human Anatomy and Physiology 1
   b. BI 208 Human Anatomy and Physiology 2
   c. EN 211 English Composition II
   d. MA 111 College Algebra for Calculus Preparation
   e. CH 105 Chemical Principles or higher
   f. HL 101 Medical Terminology or higher
   g. Social Responsibility in Diverse World Elective
3) Human Anatomy and Human Physiology must have been completed within a six-year period.
Part II
Submission of application materials.
An applicant must submit the following by April 1:
1) A completed official program application/attachments.
   a. Letter of Introduction/Intent
      i. Maximum 3 pages
         1. Short autobiography (life experiences, aspirations, etc.)
         2. Description of how you determine or evaluate your success
         3. Example of when you gave up your personal time for a community or organization as a volunteer
         4. Reasons for selecting Radiography as a future career
         5. Description of how you will benefit diagnostic imaging.
2) Official transcripts of all college/university courses must be on file with the NMU registrar. (An official transcript must have been mailed directly from the institution).
3) Documentation of community service/healthcare experience form.

Application Point Award Criteria
All applicants will be evaluated equitably according to the following point-award system. The highest-ranking applicants will be invited to participate in a personal interview with the Admission Committee.

Letter of Introduction/Intent

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressed topics</td>
<td>0-0.25</td>
</tr>
<tr>
<td>Demonstrated insight</td>
<td>0-0.25</td>
</tr>
<tr>
<td>Demonstration of personality</td>
<td>0-0.25</td>
</tr>
<tr>
<td>Grammar</td>
<td>0-0.25</td>
</tr>
<tr>
<td>Demonstration of interest in others</td>
<td>0-0.25</td>
</tr>
</tbody>
</table>

1.25 points maximum
<table>
<thead>
<tr>
<th>Health Occupations (4 points)</th>
<th>Proof of Work Experience: (Note all information below must be included in the letter to receive points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work experience with direct patient care &gt; 1000 hours of experience</td>
<td>Letter from current/former employee verifying employment. The letter must be on organizational letterhead with an original signature and must include applicant’s name, start date and end date (if applicable), employee status (full-time/part-time), number of hours worked per week (or total hours from/to date), job title, and examples of duties including type of patient interaction. Experience must be within the last 7 years.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous Patient Care Experience (2 points)</th>
<th>Proof of patient care Experience: (Note all information below must be included in the letter to receive points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNA, CMA, PCT, PCA, EMT</td>
<td>Requires certificate of completion indicating a formal training program and clinical experience but not necessarily a licensure or certification. (Ex. Certified Nurse Aide (CNA), Home Health Aide (HHA), Medical Assistant (CMA), Medication Aide, Patient Care Technician (PCT), or Patient Care Assistant (PCA), EMT or Paramedic, Phlebotomist, Psychiatric Technician, or Completion of at least 1 semester of a Vocational Nursing or Registered Nursing program with a grade of at least “C” in all courses. Must provide proof of certificate of completion. Experience must be within the last 7 years.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work/Volunteer experience (1 point)</th>
<th>(Note ALL information must be included in the letter to receive the points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit for working while attending college (not health care related area)</td>
<td>If you have maintained employment or volunteered at least 16 hours per week while attending college taking at least 6 credit hours, you may be eligible to receive additional points on the application. The letter from current/former employee verifying employment or volunteerism must be on organizational letterhead with an original signature and must include applicant’s name, start date and end date (if applicable), employee status (full-time/part-time), <strong>number of hours worked per week (or total hours from/to date)</strong>, job title, and examples of duties including type of patient interaction. If self-employed, a notarized letter will be accepted. Experience must be within the last 7 years.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation hours in Diagnostic Imaging (1-3 points)</th>
<th>Observation: Must include a letter from the institution or school detailing the # of hours completed, supervisor signature, and one page summary of activities. Observation must be in a hospital Diagnostic Imaging Department for full credit. You must have a minimum of 30 hours for points. Experience must be within the last 7 years.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;100 hours 3 points</td>
<td></td>
</tr>
<tr>
<td>81-99 hours 2.5 points</td>
<td></td>
</tr>
<tr>
<td>60-80 hours 2 points</td>
<td></td>
</tr>
<tr>
<td>41-59 hours 1.5 points</td>
<td></td>
</tr>
<tr>
<td>30-40 hours 1 point</td>
<td></td>
</tr>
<tr>
<td><strong>Observation hours in Health Care Facility Non-Diagnostic Imaging (1-2 points)</strong>&lt;br&gt;Ex. HOSA or other school program</td>
<td><strong>Observation</strong>: Must include a letter from the institution detailing the # of hours completed, supervisor signature, and one page summary of activities. Observation must be in a Health Care facility for full credit. You must have a minimum of 20 hours for points. (Ex HOSA) Experience must be within the last 7 years.</td>
</tr>
<tr>
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</tr>
<tr>
<td>≥ 40 Hours 2 points 20-39 Hours 1 point</td>
<td><strong>Volunteer in health care (1-2 points)</strong>&lt;br&gt; ≥ 40 Hours 2 points 20-39 Hours 1 point</td>
</tr>
<tr>
<td><strong>Community service or /Service Learning or Other volunteer activity (1 – 2 points)</strong>&lt;br&gt; ≥ 40 Hours 2 points 20-39 Hours 1 point</td>
<td>Community Service: Documentation (letter of certificate) of participation in a community service to benefit a health care related organization or other service learning/volunteer activity. (Ex. American Heart Association, Hospice, Health Fairs, nursing home, YMCA, UPAWS, church activities) Experience must be within the last 7 years.</td>
</tr>
<tr>
<td><strong>RT Program – Clinical Experience (1-3 points)</strong>&lt;br&gt;Minimum 200 documented hours RT Program – Courses Intro Courses or Program courses will be evaluated by the Program Director for additional points on application – must have completed at least 8 credit hours with a B or better.</td>
<td><strong>Previous Radiologic Technology Program Experience.</strong>&lt;br&gt;For applicants previously admitted in the NMU or other RT program, applicant must submit a self-evaluation letter describing reasons for leaving the program, and what steps have been taken to ensure success if applicant is admitted to the NMU RT program. The Program Director must verify the number of clinical hours completed by providing a letter documenting attendance in program, number of clinical hours completed, and reasons for leaving the program early. Only students in Good Standing will be given additional points. Per the ARRT Code of Ethics, students who have been dismissed from a program due to Ethics violations such as patient safety/radiation safety, many not be eligible to be admitted into another program. Background and/or ARRT clearance may be required. For Rad Tech Course evaluation, a copy of transcripts from the institution must be included with the application for credit.*Applicant still must complete 16 credit hours at NMU.</td>
</tr>
</tbody>
</table>

### Part III

**Supportive Course Cumulative GPA**<br>(College Composition II, Human Anatomy, Human Physiology, College Algebra)

| 3.8-4.0 | 7 points | 3.0-3.19 | 3 points |
| 3.6-3.79 | 6 points | 2.8-2.99 | 2 points |
| 3.4-3.59 | 5 points | 2.7-2.79 | 1 point |
| 3.2-3.39 | 4 points | | |

7 points maximum
Part IV

Admission Committee Interview.
Application interviews will be conducted mid-May.
An applicant will be evaluated on the following criteria in their interview.

- Knowledge of Profession: 0-1 point
- Dedication: 0-1 point
- Managing Change: 0-1 point
- Accountability: 0-1 point
- Interpersonal Skills: 0-1 point

Total/3 interviewers: 15 points maximum

Program Acceptance:

Applicants will receive notification of their acceptance into the program by formal letter no later than June 1. Information in regards to program entrance status is mailed to the last address provided. It is the applicant’s responsibility to maintain current contact information. An applicant that cannot be reached will forfeit their position of acceptance.

Applicants, who are not selected in the initial round, are ranked highest to lowest according to their total award points and assigned alternate status. Alternates are offered enrollment in ranked order if a selected candidate declines admission or does not qualify based on health status or criminal background search. Alternate status terminates when the new school year begins in August. Those wishing to be considered for the following year must reapply. NMU Radiography Program does not maintain an applicant waiting list.

Health Status, Criminal Background Check, American Heart Association (AHA) Basic Life Support (BLS) for Healthcare Providers (CPR and AED) Certification, Drug Screen and Fingerprinting.
Only those applicants accepted into the program complete Part IV of the Admission Process. This includes: immunizations, a criminal background check, AHA BLS certification, drug screen, and completion of the required forms of documentation. Select clinical affiliates may require fingerprinting.

Please be advised: The cost of immunizations, criminal background check, AHA BLS certification and drug screen is the responsibility of the student. (Healthcare services may be available at your local health department or university health center). The party responsible for the cost of the fingerprinting is determined by the clinical affiliate.

Enrollment into and graduation from the Radiography Program is contingent upon an accepted candidate’s demonstration of the requirements listed below.
Health Status:
The following forms and supporting information are to be completed with authorized signatures and submitted to CastleBranch no later than July 15.

1. Immunizations. Please upload documentation of your immunization record by completion of the School of Clinical Sciences Verification of Immunization and Health Status Form.
   a. Varicella, rubella, and rubeola immunity
2. Hepatitis B. Please upload a copy of your Hepatitis B vaccination series completion or declination.
3. A two-step TB skin test to be completed after admission to the Program. The tests need to be administered 7-14 days apart. Please upload a copy of your TB skin test results.
4. Tetanus within the last 10 years and upload documentation.
5. Influenza immunization – to be completed in season no later than November 1.

All requirements are subject to change based on clinical affiliate requirements.

Criminal Background Check:
Students applying to the health professions programs must provide a valid social security number in order to complete the criminal background check required by clinical agencies and to take licensing/certification exams. Students demonstrating a positive background check will be denied admission to the health professions programs. Students demonstrating a positive background check while enrolled in health profession programs will be dismissed from the program. The criminal background check will be completed at cost to the student.

Please be advised: Conviction of a crime may affect a student’s eligibility for licensure by the American Registry of Radiologic Technology (ARRT). Any student with a conviction record is advised to contact the American Registry of Radiologic Technologists at 615.687.0048 or at www.arrt.org in regards to their ability to complete the licensure registry examination upon completion of the program.

CPR/BLS Certification:
For the protection of patients, employees, and students, it is the policy of NMU all students must successfully complete the American Heart Association (AHA) Basic Life Support (BLS) for Healthcare Providers (CPR and AED) Program. The American Red Cross Certification is not acceptable. A copy of your certification card must be submitted to CastleBranch by July 15. Certification will be completed at cost to the student.

Drug Screen:
For the protection of patients, employees, and students, it is the policy of NMU all students must complete a drug screen through Occupational Medicine Services in Marquette. The drug screen will be completed at cost to the student.

Please be advised: Students demonstrating a positive drug test will be denied placement; however, they may have their application reconsidered for future admission to the Radiography Program at the Program Director’s discretion if clinical placement is available.

Upon change in clinical placement, additional requirements may need to be completed.
Admission to the Radiography Program

Students must complete a four part application process for acceptance into the Radiography Program. The deadline for application submission is April 1. Students will be notified of their acceptance no later than June 1.

Admission Criteria:

1. Overall GPA of 2.5 minimum
2. No less than a grade of “C” in the following prerequisite courses:
   a. BI 207 Human Anatomy and Physiology 1
   b. BI 208 Human Anatomy and Physiology 2
   c. EN 211 English Composition II
   d. MA 111 College Algebra for Calculus Preparation
   e. CH 105 Chemical Principles or higher
   f. HL 101 Medical Terminology or higher
   g. Social Responsibility in Diverse World Elective
3. If the Human Anatomy and Human Physiology courses are more than 6 years old they must be re-taken.

Information:
   Acceptance is competitive in 2nd year
   Student capacity is 20/year for years 2 & 3
   2nd and 3rd years include Summer clinical experiences
   Entry into the 2nd year begins only in Fall
   Website for additional information: www.nmu.edu/clinicalsciences

Program Director Information:
   Shaun Thunell, D.C., M.Ed., R.T.(R)(ARRT)
   227-2868
   Office: NMU West Science, 3713
   Email: sthunell@nmu.edu
# Radiography

## Semester 1 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 111</td>
<td>College Composition I (F,W,S)</td>
<td>4</td>
</tr>
<tr>
<td>BI 207</td>
<td>Human Anatomy &amp; Physiology 1 (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>MA 111</td>
<td>College Algebra (or above) (F,W,S: C- or higher in MA 100)</td>
<td>4</td>
</tr>
<tr>
<td>CH 105 or 109</td>
<td>Chemical Principles or Intro Organic &amp; Biochemistry (F,W)</td>
<td>4</td>
</tr>
</tbody>
</table>

## Semester 2 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 211</td>
<td>College Composition II (F,W,S: EN 111)</td>
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<tr>
<td>SOCR</td>
<td>Social Responsibility in a Diverse World</td>
<td>4</td>
</tr>
<tr>
<td>BI 208</td>
<td>Human Anatomy &amp; Physiology 2 (F,W: BI 207)</td>
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</tr>
<tr>
<td>RAD 109</td>
<td>Introduction to Radiography (W)</td>
<td>2</td>
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<tr>
<td>HL 101</td>
<td>Medical Terminology (F,W)</td>
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</tbody>
</table>

All required courses listed above must be completed prior to admission into program.

## Semester 3 (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>RAD 261</td>
<td>Radiation Prot. and Bio.</td>
<td>2</td>
</tr>
<tr>
<td>RAD 262</td>
<td>Methods of Patient Care</td>
<td>3</td>
</tr>
<tr>
<td>RAD 263</td>
<td>Radiography Clin. Exp. I</td>
<td>2</td>
</tr>
<tr>
<td>RAD 264</td>
<td>Radiographic Procedures I</td>
<td>5</td>
</tr>
<tr>
<td>CLS 100</td>
<td>Obtaining a Blood Specimen (F,W)</td>
<td>1</td>
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</tbody>
</table>

## Semester 4 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>RAD 265</td>
<td>Principles of Rad. Prod. and Equipment</td>
<td>3</td>
</tr>
<tr>
<td>RAD 266</td>
<td>Radiography Clin. Exp. II</td>
<td>6</td>
</tr>
<tr>
<td>RAD 267</td>
<td>Radiographic Procedures II</td>
<td>5</td>
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</table>

## Summer Session

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>RAD 363</td>
<td>Clinical Exp. III</td>
<td>4</td>
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## Semester 5 (Fall)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>RAD 361</td>
<td>Diagnostic Image Prod.</td>
<td>3</td>
</tr>
<tr>
<td>RAD 366</td>
<td>Radiography Clin. Exp. IV</td>
<td>8</td>
</tr>
<tr>
<td>RAD 364</td>
<td>Image Proc. &amp; Quality Mgmt.</td>
<td>3</td>
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</table>

## Semester 6 (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>RAD 362</td>
<td>Sect. Imaging and Anat.</td>
<td>2</td>
</tr>
<tr>
<td>RAD 365</td>
<td>Radiographic Pathology</td>
<td>2</td>
</tr>
<tr>
<td>RAD 367</td>
<td>Issues in Radiography</td>
<td>1</td>
</tr>
<tr>
<td>RAD 368</td>
<td>Radiography Clin. Exp. V</td>
<td>8</td>
</tr>
</tbody>
</table>

## Total Credits Required for Degree

89

Fall 2019
Surgical Technology Program
Surgical Technology Program

Mission Statement and Goals:
The mission of the Northern Michigan University Surgical Technology Program is to prepare its graduates as entry-level surgical technologists that are knowledgeable, skilled, and have developed the essential behaviors of the profession. This preparation will occur in the cognitive, psychomotor, and affective learning domains.

To accomplish this mission, the graduate of the NMU Surgical Technology Program will realize the following goals:

- Maintain a “surgical conscience” and accountability for personal actions (affective)
- Apply knowledge of the biologic sciences, pharmacology and biomedical technology to their role in the operating room (cognitive)
- Demonstrate and value the learning and skills that are required for safe practice in the operating room (psychomotor)
- Communicate effectively with team members, patients, and families (psychomotor)
- Assume responsibility as a member of the profession of surgical technology through maintenance of established standards of practice, professional ethics, and ongoing self-evaluation (affective)

Employment:
Students carrying a full-time course load should be employed no more than 10 to 15 hours per week. Employment in excess of 15 hours per week should be accompanied by corresponding reduction of course load.

The Surgical Technology Student
As members of the University, the faculty assumes responsibility for admission and assistance of students who have potential for success. The faculty are committed to the development of a learning environment which will promote the personal, intellectual, social and career development of underrepresented ethnic students and enhance the sensitivity and knowledge of the majority populations of the special needs and concerns of these individuals. The faculty believe that learning is the process of integrating skills, attitudes, values, beliefs and insights into self within an atmosphere of academic inquiry. It is further believed that teaching is a process of assessing the needs and potential of students in an environment where the teacher serves as a facilitator of learning and critical thinking. The faculty support the right of the student to challenge and debate beliefs within the context of academic freedom.
Upon graduation the surgical technologist will be able to demonstrate the following entry level competencies:

**Member of the Health Care Team**

1. Describes the role of the Surgical Technologist
2. Identifies the types of health care facilities and members who work as a team within them.
3. Describes the members of the surgical team and their roles.
4. Identifies the personnel and their roles within the surgical department.
5. Demonstrates effective communication within the role and the responsibilities of the surgical technologist.
6. Define and interpret ethical, moral and legal responsibilities.
7. Trace the historical development of surgery and the personnel working within the profession.
8. Use the correct medical language to describe the situations and activities associated with the patient who has surgery.
9. Describe the professional organizations related to the education and certification of the surgical technologist.
10. Describe responsibilities related to becoming and continuing with certification as a Surgical Technologist.
11. Demonstrate the steps necessary to obtain employment as a Surgical Technologist.
12. Discuss professionalism as it relates to surgical technology.

**Science of the Human Body**

1. Name the body planes, structure, regions, organization and closed cavities of the body.
2. Describe the cellular, tissue and organ function and structure of the human body.
3. Describe the structure and characteristics of microorganisms.
4. Discuss the factors that allow pathogens to invade a host and cause disease.
5. Describe the individual human mechanisms/responses and the health care workers methods to control and/or prevent invasion of pathogens and development of infection.
6. Describe how tissues react to wounds, stages of healing, types of healing, classification of surgical wounds and complications in wound healing.
Management of the Patient in Surgery

1. Demonstrate math for drug calculations, identify medications and anesthesia agents used in care of the surgical patient.
2. Demonstrate procedures for the care and handling of drugs.
3. Explain the types of anesthesia and related interaction of drugs given to patients.
4. Describe the stages of anesthesia and patient reactions, monitoring of patient and complications of anesthesia.
5. Describe the legal rights of the patient undergoing surgery.
6. Describe the responsibilities of each member of the surgical team to protect the legal/ethical rights of the patient.
7. Describes the steps done by members of the health care team in preparing the patient for surgery.
8. Demonstrate the handling and labeling of specimens obtained during surgery.
9. Describe the steps required in monitoring the patient’s temperature, blood volume, fluid and electrolyte balance and vital signs during surgery.
10. Identify signs of a medical emergency and describe the steps and procedures required to manage it.
11. Demonstrate methods and types of documentation and record keeping used in surgery.
12. Identify the principles and methods of sterilization and environmental disinfection.
13. Describe all instruments, their use in procedures and requirements for sterilization.
14. Identify the various sutures, needles, catheters, drains, dressings, etc. used during surgery.
15. Demonstrate the use, care, handling and cleaning of the varied equipment used to carry out surgical procedures.
16. Demonstrate the principles of draping the wound and maintaining a sterile field.
17. Demonstrate the sterile hand scrub, gowning/gloving of self and others, handling of instruments during preparation for onset of surgery.
18. Demonstrate the intraoperative techniques necessary in carrying out the surgical procedure.

Clinical Case Requirement for Program Completion

**Student’s Total Case Requirement:** 120 cases (80 in First Scrub (FS) Role & 40 in Second Scrub (SS) Role.

**General Surgery Case Requirements:** 30 total General cases with 20 being in First Scrub Role and 10 in the Second Scrub Role.

**Specialty Surgery Case Requirements:** 90 total Specialty cases with 60 being in the First Scrub Role and 30 in the Second Scrub Role (OBGYN, ENT, GU, Ortho, Ophthalmic, Oral/Maxillofacial, Plastics, Cardio-Thoracic, Peripheral Vascular, Neuro & Pediatrics are considered Specialty Cases).

**Observation (OV) Role:** Cases observed must be documented but do not count towards 120 case requirement.

**Diagnostic Endoscopy Cases:** Second Scrub Role in up to 10 cases (Cystoscopy, Ureteroscopy, Bronchoscopy, EGD, ERCP, Colonoscopy, Esophagoscopy, Laryngoscopy, Sinoscopy, Panendoscopy) can be used to achieve the 40 SS cases and the 120 total cases.

**Labor & Delivery Cases:** Second Scrub Roles in up to 5 vaginal Births may be counted in order to achieve the 40 SS cases and the 120 total cases.

**Surgical Technology Program Description**
This program encompasses 4 consecutive semesters and summers. The last semester provides
ample clinical experiences through a Practicum in a U.P. hospital. Transportation to these facilities is the students responsibility. Surgical Technology courses which include theory lectures are held on campus. Graduates of the program are prepared to work in hospitals and ambulatory surgical facilities.

The program is approved by the Michigan State Department of Vocational Education. The program is accredited by the Commission on Accreditation of Allied Health Education Programs. This national accreditation allows graduates of the program to sit for the National Certification Exam administered by the National Board of Surgical Technology and Surgical Assisting (NBSTSA). This certification is recognized nationwide.

**Surgical Technology Essential Functions**

Surgical Technology is an occupation which involves daily contact with individuals and requires ability to perform a wide variety of activities. Some individuals might not be suited to perform the activities of a surgical technologist. Many hospitals require physical examination, laboratory testing and x-rays prior to hiring an individual to rule out pre-existing conditions which could cause problems in performing the expected duties. If you have any condition which might impair your ability to perform the activities required of a surgical technologist, you might wish to reconsider applying for admission to the Surgical Technology major. Indicated below are core performance standards for admission and progression in the Surgical Technology Program.

<table>
<thead>
<tr>
<th>CORE PERFORMANCE</th>
<th>STANDARD</th>
<th>EXAMPLES OF NECESSARY ACTIVITIES (not all inclusive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Communication abilities sufficient for interaction with others in verbal and written form.</td>
<td>Anticipate and communicate needs of the surgeon while working in a sterile environment.</td>
</tr>
<tr>
<td>Mobility</td>
<td>Capability to stand in one place for long periods of time.</td>
<td>Participating in lengthy and often physically demanding surgical procedures.</td>
</tr>
<tr>
<td>Motor Skills</td>
<td>Gross and fine motor abilities sufficient to provide safe and effective technical skills.</td>
<td>Assemble multi-piece instruments correctly and efficiently for use in the sterile field.</td>
</tr>
<tr>
<td>Hearing</td>
<td>Auditory ability to hear in the surgical environment where masks are worn and many noise distractions may be present.</td>
<td>Able to hear physicians requests and commands under intense circumstances.</td>
</tr>
<tr>
<td>Visual</td>
<td>Visual ability sufficient for performing technical tasks in a variety of light intensities.</td>
<td>Work under very intense lights and also in semi-darkness and also with almost invisible suture material.</td>
</tr>
<tr>
<td>Tactile</td>
<td>Tactile ability for working with very delicate equipment.</td>
<td>Ability to load very fine needles and handle very delicate instruments.</td>
</tr>
</tbody>
</table>

Adapted from MAIN Dimensions
Clinical Sciences & Surgical Technology
Application Form Instructions

Please complete the required forms and submit to the School of Clinical Sciences Secretary,
West Science Room 3515 and she 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

The immunization record (both pages) must be completed and the form signed by a physician,
nurse practitioner, registered nurse, or other licensed health official. This document will
require submission with CastleBranch, which you will receive instructions for upon admission.

You DO NOT need to supply the tuberculin test information at the time of application.
The TB test must be given within 6 months of the beginning of your practicum. If you are
required to complete a two-step TB test, the tests need to be administered 7-14 days apart with
one injection in each arm. Please update your immunization record when the TB test(s) is/are
done.

Health insurance policy number must be included on the immunization record.

NOTE: Surgical Technology students must have a baseline eye exam. A signature is required and a
copy of the eye exam results must be included with the application.

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.
Admission to the Surgical Technology Program

Upon completion of the ST 101 and 2 additional ST courses, students will complete the application found in the Clinical Sciences Policy Manual. The deadline for submission is October 1st for admission to the January clinical practicum and April 1st for the August clinical practicum.

Admission Criteria:
1. Overall GPA of 2.0 minimum and 2.0 in the major.
2. No less than a grade of “C” in the following prerequisite courses:
   a. Any ST course
   b. BI 207 Human Anatomy and Physiology 1
   c. BI 208 Human Anatomy and Physiology 2
   d. CLS 171 Medical Terminology
   e. CLS 204 Clinical Microbiology
   f. CLS 109 Intro to Diagnostic Science
3. If the Human Anatomy and Human Physiology courses are more than 10 years old they must be re-taken.
4. Must pass a comprehensive entrance exam with minimum score of 70%.
5. Must successfully pass a 22-step test out prior to clinical placement.
6. Comprehensive ST 250 exit exam with minimum passing score of 80%.

Placement Criteria:

Criminal Background Checks:
Students applying to the health professions programs must provide a valid social security number in order to complete the criminal background check required by clinical agencies and to take licensing/certification exams. Students demonstrating a positive background check will be denied admission to the health professions programs. Students demonstrating a positive background check while enrolled in health profession programs will be dismissed from the program. The criminal background check will be completed at cost to the student within 90 days of clinical placement.

CPR/BLS Certification:
For the protection of patients, employees, and students, it is the policy of NMU all students must successfully complete the American Heart Association Basic Life Support (BLS) for Healthcare Providers (CPR and AED) Program. The American Red Cross Certification is not acceptable. A copy of your certification card must be provided. The certification will be completed at cost to the student.

Fingerprinting:
Select clinical affiliates may require fingerprinting. The party responsible for the cost of the fingerprinting is determined by the clinical affiliate.

Drug Screen:
For the protection of patients, employees, and students, it is the policy of NMU all students must complete a drug screen through Occupational Medicine Services in Marquette. The drug screen will be completed at cost to the student within 30 days of clinical placement.

Please be advised: Students demonstrating a positive drug test will be denied placement; however, they may have their application reconsidered for future admission to the Surgical Technology Program at the Program Director’s discretion if clinical placement is available.
### SRGICAL TECHNOLOGY
**(Associate Degree)**

<table>
<thead>
<tr>
<th></th>
<th>If starting in Fall</th>
<th>If Starting in Winter</th>
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<tbody>
<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td>ST 101</td>
<td>Clinical Assisting</td>
<td>ST 101</td>
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<tr>
<td>ST 111</td>
<td>Basic Surg. Conc. &amp; Tech.</td>
<td>ST 111</td>
</tr>
<tr>
<td>BI 207</td>
<td>Human Anatomy &amp; Phys 1</td>
<td>BI 207</td>
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<tr>
<td>EN 111</td>
<td>English Composition I</td>
<td>EN 111</td>
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<tr>
<td>CH 105, 109 or 111 Elective</td>
<td>4-5</td>
<td>CH 105, 109 or 111 Elective</td>
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<td><em>MATH (see below)</em></td>
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<tr>
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<td><strong>Winter Semester</strong></td>
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<td>ST 211</td>
<td>General Surg. Proc.</td>
<td>ST 211</td>
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<tr>
<td>CLS 109</td>
<td>Intro. To diag. Sci.</td>
<td>CLS 109</td>
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<tr>
<td>CLS 171</td>
<td>Medical Terminology</td>
<td>CLS 171</td>
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<tr>
<td>BI 208</td>
<td>Human Anat &amp; Phys 2</td>
<td>BI 208</td>
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<tr>
<td>HL 125</td>
<td>Emer. Care for Health Prof</td>
<td>HL 125</td>
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<tr>
<td><strong>Summer Session</strong></td>
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<tr>
<td>ST 220</td>
<td>Issues and Seminar for ST</td>
<td>ST 220</td>
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<td>15</td>
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<td><strong>Fall Semester</strong></td>
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<tr>
<td>ST 212</td>
<td>Spec. Surg. Proc./Pharm.</td>
<td>ST 211</td>
</tr>
<tr>
<td>CLS 204</td>
<td>Clinical Microbiology</td>
<td>CLS 204</td>
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<tr>
<td>EN 211</td>
<td>English Composition II</td>
<td>EN 211</td>
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<td>Social Responsibility in a Diverse World</td>
<td>SOCR</td>
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<td><strong>Winter Semester</strong></td>
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<td>ST 260</td>
<td>Surg. Tech. Practicum</td>
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<tr>
<td>ST 250</td>
<td>Clinical Practice</td>
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</table>

**Total Credits for Degree:** 64 credits

*Students who take the math placement test and score into MA 111 or higher are exempt from Math - otherwise MA 100 is required.*
Clinical Health Science Program

Career Ladder Program for Radiography Respiratory Therapy Surgical Technology
Clinical Health Science: BS Degree Program

The Clinical Health Science degree is designed for certified clinical professionals with a minimum of an associate’s degree or equivalent, providing them with the desired baccalaureate degree needed for professional advancement. Radiography (RAD), Surgical Technology (ST) and Respiratory Therapy (RSP) are all currently at the associate’s degree level. This degree completes the general education requirements in any baccalaureate degree and complements this with clinically relevant professional courses. A Bachelor of Science degree is preferred for positions such as supervisor or program director or to compete effectively in medical supply companies and equipment vendors. Many students and professionals in these fields seek a BS degree to aid in their transition to management or education positions within their fields. The Clinical Health Science degree meets this need. There is a shortage of personnel in these health professions and it is likely that many potential BS degree candidates are already working in the field. Therefore this degree is designed to accommodate students who may be off-campus, practicing at a clinical site.

Total Credits Required for Degree 120

General Education 30-40
Required Courses in Major 43-70
Clinical Specialty Area 32-59
   RAD, RSP, ST courses in Associate Degree
   CLS 313 Introduction to Clinical Research 1
   CLS 410 Introduction to Clinical Management 1
   CLS 420 Clinical Educational Practices 1
   MA 109 Introduction to Probability and Statistics (QUAR) 4
   MGT 240 Organizational Behavior and Management 4

Other Required Courses 19
   BI 207 Human Anatomy and Physiology 1 4
   BI 208 Human Anatomy and Physiology 2 4
   HL 101 Medical Terminology for Health Educators or
      CLS 171 Medical Terminology 1-4
   MA 113 Finite Mathematics (QUAR) or
      MA 111 College Algebra for Calculus Preparation (QUAR) 4
   CIS or CS or IS electives 2-4
   Chemistry elective 105 or higher (CH 105, 109 or 111 SCII) 4
   General Electives if required
Online or Distance Options for Courses

If students are NMU graduates from RAD, RSP, or Surg Tech, then (depending on the major) they will likely have the following courses to complete, which can all be completed without being on campus (with the exception of the HP activity course):

*Social Responsibility in a Diverse World (SOCR) 4 credits
**Online options include:** EN 311Z, GC 300, HS 254, LDR 300, NAS 204 and SO 322.

*Integrative Thinking (INTT) 4 credits
**Online options include:** AH 102, GC 101, LDR 400, and SP 110,

Human Expression (HUME) 4 credits
**Online options include:** EN 110, EN 112, and TH 130

*Perspectives on Society (PERS) 8 credits
**Online options include:** CJ 110, EC 101, LDR 200, NAS 330, and SO 113

*Scientific Inquiry 8 credits
**Online options include:** GC 210 and LDR 220

Other Online Required Courses:
MA 111 College Algebra
CIS 110 Intro to Computers
MGT 240 Intro to Management
CLS 420 Clinical Educ. Practices
CLS 410 Clinical Management
CLS 313 Intro to Research

*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) – SCII
  *LDR 300 Leadership in Diverse Workplaces (4) – SOCR
  *LDR 400 Systems Thinking in Workplace Leadership (4) – INTT

Fall 2019
Speech, Language and Hearing Program
Speech, Language, and Hearing Sciences

**Mission Statement:** The Speech, Language, and Hearing Sciences Program offers an undergraduate curriculum that emphasizes human communication processes and the disorders that may impact these processes. The program prepares students for graduate study or employment opportunities in Speech-Language Pathology, Audiology, or related fields.

**Goals:** Mission goals are accomplished through:

1. The provision of academic training that will lead to the admission process for a graduate degree in speech-language pathology or audiology or employment in related chosen fields.
2. The provision of academic service learning opportunities that will broaden community interaction in the undergraduate academic experience.

Program Knowledge Outcomes:

1. Students enrolled in the SLHS major will demonstrate knowledge of the biological sciences, physical sciences, mathematics, and the social/behavioral sciences (ASHA Certification Standard IV-A).
2. The student enrolled in the SLHS major will demonstrate knowledge of basic human communication and swallowing processes, including their biological, neurological, acoustic, physiological, developmental, and linguistic and cultural bases (ASHA Certification Standard IV-B).
3. The student must have demonstrated knowledge of communication and swallowing disorders and differences (ASHA Certification Standard IV-C).
4. Students in this program acquire 25 hours of observation experience and begin to acquire clinical clock hours. This targets Certification Standard V-A which states the following: The applicant for certification in speech-language pathology must complete a minimum of 400 clock hours of supervised clinical experience in the practice of speech-language pathology. Twenty-five hours must be spent in the clinical observation (**completed in the SLHS major at NMU**), and 375 hours must be spent in direct client/patient contact. (ASHA Certification Standard V-A).
Essential Functions for Speech-Language Pathologists and Audiologists

Listed below are the essential abilities that someone who enters the professions of speech-language pathology and audiology must possess and therefore are required of undergraduate students majoring in Speech, Language and Hearing Sciences.

**Physical Abilities**
- Participate in classroom or clinical activities for 2-4 hour blocks of time with one or two breaks.
- Move independently to, from and within academic/clinical facilities.
- Provide for or direct one’s own personal hygiene.
- Manipulate screening/diagnostic/therapeutic/educational materials.
- Respond to emergency situations including fire, choking and in the application of universal precautions.
- Visually monitor client responses and use of materials.
- Aurally monitor and orally model correct speech and language production.

**Interpersonal Abilities**
- Work effectively with people.
- Make appropriate decisions, including the ability to evaluate and generalize appropriately without immediate supervision.
- Understand and respect authority.
- Maintain appropriate workplace behavior, including punctuality and regular attendance.
- Maintain composure in demanding situations.
- Complete responsibilities promptly and according to instructions.
- Maintain appropriate relationships with clients, students, instructors/supervisors, and colleagues.
- Communicate effectively with people in person, by telephone, and in written form by considering the communication needs and cultural values of the listener.

**Speech/Language and Cognitive Abilities**
- Comprehend and read professional literature/reports.
- Write university level papers and clinical/educational reports in Standard American English.
- Speak Standard American English intelligibly, including the ability to model English phonemes, grammatical features, or other aspects of speech and language.
- Independently analyze, synthesize, and interpret ideas and concepts in academic and clinical settings.
- Maintain attention and concentration for sufficient time to complete academic/clinical activities: typically 2-4 hours with 1-2 breaks.
- Schedule and prioritize activities, and provide documentation in a timely manner.
- Comply with administrative, legal and regulatory policies as well as rules and instructions of faculty/staff within the Speech, language and Hearing Sciences program and in off-campus practicum and externship sites at the graduate level.
Speech Language and Hearing Sciences Overview:

Before concentrating on the specialized study of speech and hearing disorders, an undergraduate is expected to complete courses in the general education program. This program is based on the principle that well-educated persons need to know more than can be learned from their areas of concentration. Courses are typically completed by the end of the third semester of enrollment. Major professional training courses in speech pathology and audiology and minor area professional emphasis courses are typically completed during the junior and senior years. Additional elective courses in the area of learning disabilities, sociology, psychology, writing and public speaking are selected under the direction of the academic advisor. These additional elective courses lend themselves to a comprehensive professional training experience.

The General Education Program is designed to complement a student’s academic major by promoting the integration of knowledge derived from multiple perspectives and stresses the development of problem-solving skills and intellectual creativity through the exploration of a broad range of disciplines and fields.

Each student is required to complete a minimum of 30-40 credit hours taken from general education courses or from program courses especially designated or approved to fulfill the general education requirements. Students must complete ten (10) courses from the components listed below. Students must achieve a grade point average of "C" (2.0) or better across all ten courses to count toward the General Education Program requirements. The credits are granted upon achievement of (a) passing grades in designated or approved courses or (b) passing scores on designated or approved proficiency examinations. **Note: A grade of B or better in EN 111 and EN 211 writing courses is required for the Speech, Language and Hearing Sciences major.**

Students are advised that it will be necessary to earn a Graduate Degree (Master’s Degree or Doctoral Degree) in order to achieve certification by the American-Speech-Language-Hearing Association. The American-Speech-Language-Hearing Association is the professional, scientific, and credentialing association for audiologists, speech-language pathologists and speech, language, and hearing Scientists. Students interested in pursuing a career in audiology are advised that a doctoral degree is necessary in order to achieve certification by the American-Speech-Language-Hearing Association. Entrance into Graduate Schools in the area of Speech Language and Hearing Sciences typically requires the applicant to demonstrate overall grade point average (GPA) at or above 3.5. Additional requirements include three letters of recommendation describing the student’s character, clinical achievement, critical reading and writing skills, and completion of the graduate record examination (GRE).

**Advising Tracks in the SLHS major.**

Effective September 1, 2011, students enrolled in the Speech, Language, and Hearing Sciences major will be carefully monitored by their assigned academic advisors. Based on overall GPA, SLHS students will be assigned to either the Graduate School Track or the Bachelor’s Career Track. Students with an overall GPA, in any given semester, of 3.0 or above will be assigned to the Graduate School Track. Students with an overall GPA of 2.9 or below, in any given semester, will be assigned to the Bachelor’s Career Track. This is a policy for advising within
the School of Clinical Sciences for SLHS majors and does not appear on a student’s transcript. Students will be assigned to Advising Tracks based on GPA in order to work with students on their best options after graduation from Northern Michigan University with the SLHS major. The courses for the two tracks are the same. No other courses are required specific to a student’s GPA level placing them in one or the other advising tracks. The decision for advising tracks was based upon 6 years of data from students in this program who have applied to graduate schools. This data revealed that students with less than a 3.0 GPA (overall) were not admitted to any graduate speech-language and hearing science programs regardless of how many graduate programs they made application. If a student has an overall GPA of less than 3.0 at the beginning of the first semester of their senior year (this is when SLHS students are typically preparing their graduate program applications), it is the School’s Policy that the faculty will not write letters of recommendation for Speech-Language Pathology graduate program applications for these students. Students with an overall GPA of 2.9 or below who are placed in the Bachelor’s Career Track during the first semester of their senior year should continue to work with their academic advisor on career options in which they can be successful with a bachelor’s degree in speech, language, and hearing sciences. Please refer to the following website for more information.

The Speech, Language and Hearing Sciences Major:
This program provides the necessary coursework to apply to a graduate program accredited by the Council for Academic Accreditation of the American Speech-Language-and-Hearing Association.

<table>
<thead>
<tr>
<th>Total Credits Required for Degree</th>
<th>120 credit hours</th>
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</thead>
<tbody>
<tr>
<td>General Education</td>
<td>30-40 credit hours</td>
</tr>
<tr>
<td>Required Courses in Major</td>
<td>58 credit hours</td>
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</table>

SL 150 Introduction to Speech, Language and Hearing
SL 160 Anatomy of the Speech and Hearing Mechanism
SL 200 Phonetics
SL 257 Fluency Disorders
SL 320 Speech and Voice Science
SL 351 Introduction to Audiology
SL 355 Language Development
SL 356 Language Disorders
SL 370 Observation
SL 400 Phonological Disorders
SL 451 Aural Rehabilitation
SL 459 Cognitive Neuroscience
SL 460 Cognition and Aging
SL 464 Methods of Diagnosis
SL 465 Methods of Treatment

Other Required Courses 15 credit hours
This program requires a major/minor in Speech, Language and Hearing Sciences with the following courses added to the curriculum instead of a traditional minor:

PSY 100 Introduction to Psychology
PSY 201 Psychological Research 1: Statistical Applications OR MA 109 Introduction to Probability and Statistics
PH OR CH Physical Sciences Elective
BI Elective in Human or Animal Sciences (BI 104, BI 111, BI 203, BI 207, BI 208, BI 221, BI 225 OR BI 312)

Elective Courses in Major
SL 252 American Sign Language I (4 credits) (V)
SL 253 American Sign Language II (4 credits) (V)
SL 354 American Sign Language III (4 credits)
SL 490 Seminar in SLHS
This manual serves as a guide for Northern Michigan University students who are enrolled in any area of practical experience from the Speech, Language, and Hearing Sciences Program, and addresses policies and procedures for student clinical experiences here. It is applicable for all aspects of the clinical program and all student clinicians will be expected to comply with the following policies unless otherwise directed by a clinical supervisor.

Practical Experience in Speech, Language, and Hearing:

The clinical program in Speech, Language, and Hearing at Northern Michigan University has been established to allow students the opportunity to begin to fulfill requirements for practical experience at the academic level set forth by ASHA. Students must attain a total of 400 clock hours of supervised practicum by the end of their graduate training, of which 375 must be in direct client/patient contact and 25 in clinical observations. Speech-language pathology clock hours consist of observation and practice in prevention, assessment and intervention of the following types of disorders: articulation, fluency, voice and resonance, receptive and expressive language, hearing, swallowing, cognitive and social aspects of communication, and communication modalities (ex. augmentative communication systems).
Northern Michigan University Speech, Language and Hearing Clinic:

The NMU Speech, Language and Hearing Clinic is housed within the School of Clinical Sciences in the Luther S. West Science Building. Children and adults receive speech, language, and hearing services provided by our undergraduate student clinicians under the supervision of a certified speech-language pathologist or audiologist. Normal hours of operation are 1:00 to 6:00 p.m., Mondays and Wednesdays, during the fall and winter semesters and at specified times during May-August. The Clinic is closed during holidays, vacations, and during such times as the University is officially closed due to inclement weather. The Clinical Coordinator will announce specific schedules at the beginning of each semester. Additional opportunities will be announced to students during the school year.

Policy on Student Clinical Practice:

Faculty of the Speech, Language, and Hearing Sciences program have a legal and professional responsibility to assure the public, other students, the University, and the profession of speech-language pathology that students can practice safely, appropriately, and professionally in their various clinical practice settings commensurate with their educational experiences. Speech, Language, and Hearing students provide clinical services within the boundaries of the American Speech-Language Hearing Association statement on Scope of Practice and the Code of Ethics, current professional standards of practice, School, University, policies, procedures, and protocols. While it is expected that clinical education is a process and that each clinical student will progress throughout his or her clinical education, this policy is written to protect the clients that our students diagnose and treat and to assure quality of care.

Speech, Language, and Hearing Screenings:

It is of the utmost importance that clinical students in Speech, Language, and Hearing be able to provide appropriate modeling for clients with their articulation, voice, fluency, language comprehension and expression, and pragmatic abilities, and that they hear adequately in order to judge client speech and language behavior and communication. Speech, language, and hearing screenings are performed per School policy on all students who have declared Speech, Language, and Hearing as their major. A student, who does not meet School criteria for any area of communication during these screenings, will be advised of the findings, offered full evaluation, and be appropriately advised and counseled by the faculty supervisor responsible for the screening. It is expected that students will follow up on any recommendation pertaining to communication that is made by the supervisor.
Policy on Unsafe, Unprofessional, or Weak Clinical Practice:

Students who exhibit behavior that has been judged to be unsafe, unprofessional, or weak with potential to be unsafe or unprofessional, may be removed from the clinical experience. Descriptions of these types of behavior are described below.

Unsafe practice is defined as behavior that causes harm or that has the potential to cause harm to a client or other person. Examples of unsafe practice include but are not limited to the following:
1. Practicing in a clinical experience under the influence of drugs and/or alcohol.
2. Acts of omission or commission likely to cause harm to clients, including, but not limited to, physical abuse, placing clients in hazardous positions or circumstances, mental, sexual, or emotional abuse, or the inability to provide appropriate treatment.
3. Failure to provide accurate, inclusive, written and verbal communication, or falsely documenting a clinical record, written assignment, or log.

Unprofessional Practice:

Unprofessional practice is defined as behavior that fails to follow ASHA’s Code of Ethics in matters pertaining to professionalism. Examples include, but are not limited to, the following:
1. Failure to notify the supervisor of absence or lateness.
2. Practicing in a clinical experience under the influence of drugs and/or alcohol.
3. Violating client privacy rights through breach of confidentiality or interactions or records or failure to protect the privacy in personal care.
4. Engaging in behavior that is disrespectful of a client’s social or economic status, personal attributes, or health or communicative problems.
5. Engaging in behavior that is disrespectful or uncooperative with the supervisor and/or experience site.

Weak Clinical Practice with Potential for Unsafe and/or Unprofessional Practice:

Weak clinical practice is defined as behavior that demonstrates difficulties in the areas of learning and applying academic information, communication, or interacting with others. Examples include, but are not limited to, the following:
1. Difficulty or inability to apply theoretical knowledge to specific clinical situations or to demonstrate critical thinking skills.
2. Inability to successfully document clinical interactions.
3. Inability to interpret client responses and communicative behavior.
4. Difficulty in determining priorities in completing clinical assignments.
5. Difficulty in communicating or interacting with clients, families, peers, or health care or educational personnel, or the clinical supervisor.
6. Difficulty in carrying out or interpreting suggestions from the clinical supervisor.
Procedure:
When unsafe, unprofessional, or weak clinical practice is noted in a clinical student’s behavior, the following steps will be accomplished:

1. The students’ supervisor will notify the Associate Dean and Director in writing with a copy to the student. The documentation will include details of the behavior, a description of specific actions to be taken to improve the clinical practice, any support provided by faculty to promote improvement, the time period during which the specific improvement actions must be completed, and any other recommendations. Recommendations may include, but are not limited to, the following examples:
   a. Review of academic course material
   b. Independent research
   c. Observation of clinical interactions
   d. Improvement of behavior that reflects attitude
   e. Removal of the student from the clinical experience until some appropriate goal has been reached.

   Recommendations also must include how the student is to demonstrate that the actions specified have been completed satisfactorily.

2. The student will modify the specified behavior and provide any documentation required.

3. The supervisor and Associate Dean and Director will review the documentation, determine the student’s status with regard to clinical education, and notify the student in writing in a timely manner.

4. If the student does not complete the recommendation in the specified period of time or to an adequate degree, the student fails the course and will not be considered for further clinical assignment.

5. The student may make appeals to the Associate Dean and Director and the Clinical Coordinator.
SL 370 and SL 465 Course Requirements:

1. Completion of application form which includes:
   a. Application form
   b. Hepatitis B vaccine statement
   c. Verification of Policies page attesting to the ability to meet the essential functions of the program

2. 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 through CastleBranch prior to clinical training. Students may also be required to complete Zero-Tolerance Drug Testing® 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.

SL 370: Observation:

The Observation requirement is traditionally the beginning of clinical experience for students in our program. It is designed to give students in our curriculum basic skills necessary for knowledgeable observation of speech, language, and hearing diagnostic and treatment procedures, and appropriate clinical interactions. The student is required to complete 25 clock hours of supervised observation. ASHA-certified individuals must provide supervision. This course should be completed the semester immediately prior to your enrollment in SL 465 Methods of Treatment, i.e., if you are planning to complete SL 465 during the fall semester of your final year in the SLHS program then SL 370 should be completed the winter semester of the prior academic year. If you are planning to complete SL 465 during the winter semester of your final year in the SLHS program then SL 370 should be completed during the fall semester of that academic year.

SL 370 students will maintain a log of observations and obtain the signature of the clinician at the end of each observed session. Instructions for keeping the log are provided in the initial class meeting of SL 370 for the semester. All individuals observing the clinic will maintain a quiet, clean, dark environment in the observation rooms and will ensure that parents, family members, and faculty are able to observe comfortably and are treated with the utmost courtesy and respect. Food is not allowed in the observation room; beverages are allowed, however, containers must leave the room at the end of the session. Observation logs will be kept in a confidential manner. According to rules concerning standards of confidentiality (HIPAA), observers will refrain from commenting about clients, clinicians, family members, or supervisors while in the observation room. Any discussion of session specifics will be held in a confidential place. As a reminder, the
rest rooms, hallways, and departmental offices are not appropriate places for clinical discussions.

In the event of a cancellation, the clinician is to post a notice on the office portion of the Clinic Reception Area, room 1504. In the event that Northern Michigan University is closed for breaks, holidays, or inclement weather, the Speech and Hearing Clinic is also closed and all client sessions are canceled.

All supervisors reserve the right to ask observers to vacate the observation rooms; this may become necessary because of the noise level, to make room for family members, or for an exceptional need for family counseling while in the observation room.

The SL 370 instructor will advise students of the availability of opportunities for viewing videotaped sessions. In addition, students are reminded that they may take advantage of opportunities to observe sessions outside of the Clinic under the supervision of ASHA-certified professionals. A list of local observation opportunities will be provided to students in SL 370.

**SL 465: Methods of Treatment:**

Qualified students in the Speech, Language, and Hearing curriculum are able to gain some initial clinical experience. Criteria for acceptance into undergraduate practicum include all of the following:

1. Senior standing
2. Instructor permission

Students will apply to the Clinical Coordinator for permission to enroll. Placement will be in the NMU Speech and Hearing Clinic on a space-available basis.

**Dress and Personal Appearance:**

Students are expected to dress in a manner fitting their status as professionals providing services to the public. Although a student’s physical appearance may have no relationship to the quality of treatment they provide, it is likely to influence a patient’s perception of quality and professionalism. We should always convey the finest possible impressions to our clients and parents/caregivers. While individual preferences are recognized, a clinic that deals with the public requires a conservative approach to grooming, hair, jewelry, fragrances, and dress. All students are required to wear a nametag during clinic practicum at the NMU Speech, Language and Hearing Clinic. The Clinical Coordinator will furnish details on ordering and purchasing the nametags.
Professional Dress Requirements:

- Clothing must be loose fitting, clean, neat, and in good condition.
- Clothing must be no shorter than knee length.
- Shirts must cover the abdomen and back at all times.
- Pierced body jewelry of any kind may only be worn in the ears.
- Tattoos must be covered with appropriate clothing. Visible tattoos which cannot be covered must be tasteful and discreet.
- Hair, including facial hair, must be neatly trimmed and clean, and must not interfere with the performance of your duties.
- Make-up must be tasteful and discreet.
- Footwear must be professional. Open-toed shoes are allowed only for summer clinic.
- Males should wear dress, collared or polo styled shirts that are tucked in. Turtleneck, v-neck or crewneck sweaters may also be worn.

The Following Are Not Allowed:

- Low rise pants
- Visible and/or distracting undergarments
- Shorts
- Sweatshirts, blue jean pants, sweat suits, or sportswear
- Flip flop sandals
- Leggings
- Sports insignia, logos, or slogans
- Tank tops and spaghetti straps
- Visible cleavage (front or back)

The test for clothing must include being able to sit cross-legged on the floor with no skin showing from the back of your waistband to the bottom of your shirt. Female clinicians must be able to bend over in front of the therapy room mirror without revealing cleavage.

If your supervisor determines that your attire is unacceptable, you will be asked to change. If there is not time for you to change, you will be given something to wear. Unprofessional appearance in the clinic will be reflected in your clinic grade with a second violation.

It is important that students in our clinic be aware of their dress even when they are not involved in clinic. Our clinic is a public place of business and students should dress accordingly.

All students participating in clinical activities are expected to dress and act in an appropriately “professional” manner. This includes a neat and clean appearance and appropriate verbal language. Eating and/or drinking of beverages within the clinical areas during a therapy session are not acceptable, unless it has immediate relevance to the activity being conducted. If there are any questions regarding what is appropriate, students should check with the clinical supervisor.
Confidentiality and Ethical Responsibilities:

Confidentiality of client information is of the utmost importance and must be maintained. To help ensure confidentiality, the client’s master file may not be removed from the clinic. Photocopying of information in the file is not allowed. Documents containing identifying personal client information, such as rough drafts, should be shredded once no longer needed.

In the course of observing and offering clinical services, it is important to remain non-judgmental, to maintain confidentiality, and to show respect for clients and their families. A few specific behaviors to keep in mind:

1. Make no judgmental comments about clients and their families. Our task is to find and enhance our clients’ and families resources, not to criticize their efforts, beliefs, or lifestyle. They are doing what they do because they believe that it is helpful and useful. They are doing their best.

2. Do not discuss any client in the hallways of the Clinic. Our space is small and clients and families as well as other clinicians who are uninvolved with your particular clients abound. Step into the supervisor’s office or into a therapy room and close the door (and shut off the sound system) to talk. Make neither positive nor negative remarks in the hallways. Student clinicians will not talk about information in the halls, observation rooms, waiting room, bathroom, etc., to assure that conversations are not overheard. In a like manner, written or typed documentation must be monitored so that it is not left unattended or open to public viewing or listening.

3. Keep private notes, completed test forms, lesson plans, videotapes of sessions, audiotapes, language transcripts, case history intakes, assignment sheets, etc. in your hanging file in the Audiology office. These must not be left in observation rooms, the lounge, the reception office, or anywhere else. They cannot be taken home. To do so constitutes a breach of client confidentiality.

4. Audiotapes and videotapes of client sessions must be turned in to the supervisor at the end of the semester. They should by no means leave the clinic.

5. Leave all individual identifying information off private notes if you need to work on them at home. This includes address, phone number, name, date of birth and any other information that could identify your client. Refer to the client as client or client 12, etc.

6. Do not include any individual identifying information pertaining to your clients in either e-mail or e-mail attachments to our faculty supervisor.

7. Do not write last names of clients on posted lists. This, too, is a breach of confidentiality.

8. You may discuss issues related to specific cases with faculty, provided you do not reveal any identifying information about a client. Do not hold these discussions in the hallways of the clinic or department. The purpose of these discussions should be to expand your knowledge base and better serve your clients.

9. Do not share information about clients with anyone, including other professionals, (e.g., to name a referral or to convey information to someone who also sees the client) without expressed written permission from the client, parent, or legal guardian.

10. Client reports are to be submitted to the supervisor’s mailbox in the Speech-Language and Hearing clinic office. Revised copies will be submitted to the student’s mailbox or to the student directly.
Case file (formal and informal reports, audiotapes, videotapes, pictures, test forms, etc.) information is made available to student clinicians in order to support assessment and treatment. These files are stored in the Clinic Reception Area, room 1504. Students may sign out files on the clipboard above the file cabinets. The sign-out sheet must include the student’s name, client’s name, and the date the file was checked out. Under no circumstances may a case file or portions of a formal case file be taken out of the clinic. Students may read case files within the Audiology office. They may not be transported out of the Clinic in any other manner. Students must treat files in a confidential manner; they must be checked back into the file drawer during the same business day in which they were checked out. The student will then sign off that the file was returned.

Some faculty members will require lesson plans for each session. If a faculty member requires that lesson plans be present in the observation window of your therapy room, it is the student’s responsibility to see that the plan is removed immediately after the session, since it contains information of a confidential nature.

All students are expected to perform according to the standards, practices and guidelines established by ASHA as described in the Code of Ethics.

**Infection Control Procedures:**

In addition to disinfecting the environment at the end of the session, student clinicians are expected to thoroughly wash their hands before and after each session. Disposable gloves, as well as individually-wrapped tongue depressors, are available in the Materials Room for oral procedures. Non-sterile, bulk-packaged tongue depressors are to be used only for craft projects. Gloves and tongue depressors are to be disposed of immediately after the session.

In the event that the student clinician contracts a communicable illness, he or she must inform the supervisor as soon as possible to make alternate arrangements for scheduled appointments. If the student clinician observes signs of communicable illness in his or her client or if such illness is reported to the clinician, this must be reported to the supervisor at once. The supervisor will advise the student/family of subsequent steps to be taken.

**Student Files:**

Each student majoring in Speech, Language, and Hearing has a two-part, permanent record file that is maintained within the SLHS office. The first part contains academic (application, enrollment, grade, etc.) information. The second part contains all of the student’s supervisor-signed and Clinic Recorded clock hour forms. The Clinical Coordinator will record the hours for compilation by the Clinic’s computer program, and the original clock hour forms and the most recent computer-generated summary is filed in the second portion of the student’s permanent record. A copy of the summary is provided to the student as it is updated.

Students may review their clock hour files by obtaining authorization from the Clinical Coordinator. No file will be released without this authorization. Each student is strongly urged to retain photocopies of the supervisor-signed clock hour forms in his or her own files. Students should notify the Clinical Coordinator at once of any perceived discrepancies between their records and the official record.
Requirements for the Certificate of Clinical Competence (C.C.C.):

For further details on any of the certification requirements, please see the documents at the bottom of the following web page (www.asha.org/about/membership-certification/handbooks/kasa-tips.htm) or Google KASA requirements by ASHA.

I. COURSEWORK: 75 semester credit hours (including at least 36 at the graduate level)

   Coursework must include transcript credit for each of the following areas: biological sciences, physical sciences, social/behavioral sciences and mathematics.

II. CLINICAL OBSERVATION/PRACTICUM REQUIREMENTS:

   A. Observation: 25 hours of supervised observation required.

   B. Practicum: 375 clock hours of supervised clinical practicum (at least 325 of these hours must be completed at the graduate level)

      *Supervision must be provided by individuals who hold the Certificate of Clinical Competence in the appropriate area of practice.

III. CLINICAL FELLOWSHIP YEAR: (CFY)

   After completion of the academic coursework and clinical practicum, the applicant must successfully complete a Clinical Fellowship. The Fellowship consists of at least 36 weeks of full-time professional experience or its part-time equivalent. The Fellowship must be completed under the supervision of an individual who holds the CCCs in the area for which certification is sought.

IV. NATIONAL EXAMINATION IN SPEECH PATHOLOGY AND AUDIOLOGY:

   A. After completion of the Master’s Degree, the applicant must pass a national examination adopted by ASHA for purposes of certification in speech-language pathology and/or audiology. The Praxis Examinations in Speech-Language Pathology and Audiology are a requirement for ASHA certification and for most state licensing processes.

      For further information refer to www.asha.org/students/praxis
### SPEECH, LANGUAGE & HEARING SCIENCES
#### Baccalaureate of Science

**SEMESTER 1 (Fall)**
- **SL 150** Introduction to Speech, Language and Hearing .................................. 4
- **SL 160** Anatomy of the Speech and Hearing Mechanism .......................... 4
- **EN 111** College Composition I ............................................................ 4

**SEMESTER 2 (Winter)**
- **EN 211** College Composition II (EN 111) ............................................. 4
- **PSY 100** Introduction to Psychological Science ....................................... 4
- **SOCR** Social Responsibility in a Diverse World (world culture?) ........... 4
  General Elective ............................................................................... 4

**SEMESTER 3 (Fall)**
- **SL 200** Phonetics (SL 150, SL 160, or IP) .......... 4
- **BI** Biology Course in Human or Animal Science ................................... 4
- **INTT** Integrative Thinking (world culture?) ....................................... 4
- **PERS** Perspectives on Society ................................................................ 4

**SEMESTER 4 (Winter)**
- **SL 320** Speech and Voice Science (SL 150, SL 160, SL 200) ............... 4
- **SL 257** Fluency Disorders (SL 150 or IP) ........................................... 4
- **** Physics or Chemistry Course (Lab?) .................................................. 4
  General Elective ............................................................................... 4

**SEMESTER 5 (Fall)**
- **SL 351** Intro to Audiology (SL 150, SL 160, or IP) ............................. 4
- **SL 355** Language Development (SL 150, SL 200, or IP) ..................... 4
- **SL 370** Observation (SL 150, SL 160, SL 200, SL 355, Jr. standing or IP) 2
- **PSY 201** Psychological Research: Statistical Applications .................. 4

**SEMESTER 6 (Winter)**
- **SL 356** Language Disorders (SL 355 or IP) ........................................ 4
- **SL 451** Aural Rehabilitation (SL 351 or IP) ............................................ 4
- **SL 400** Speech Sound Disorders (SL 160, 200, 220, Jr. standing or IP) .. 4
  General Elective ............................................................................... 3
### SEMESTER 7 (Fall)

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<th>Course Code</th>
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<tr>
<td>SL 459</td>
<td>Cognitive Neuroscience (includes lab) (SL 150, SL 160, Sr. standing, BI elective or PY 204 for Neuroscience majors)…</td>
<td>4</td>
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<tr>
<td>SL 464</td>
<td>Methods of Diagnosis (SL 200, SL 355, SL 356, Jr. standing or IP)</td>
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<tr>
<td>***SL 465</td>
<td>Methods of Treatment (Sr. standing in SLHS major)</td>
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<td></td>
<td>General Elective</td>
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### SEMESTER 8 (Winter)

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<tr>
<td>SL 460</td>
<td>Cognition, Communication, and Aging (PSY 100, Sr. standing or IP)</td>
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<tr>
<td>*HUME</td>
<td>Human Expression (world culture?)</td>
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<tr>
<td>PERS</td>
<td>Perspectives on Society</td>
<td>4</td>
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<td>General Elective</td>
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**TOTAL CREDITS REQUIRED FOR GRADUATION**

120

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**General Education Requirements Per Component:**

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<tr>
<th>Component</th>
<th>Requirement</th>
<th>Courses</th>
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<tr>
<td>Effective Communication (EFFC)</td>
<td>2 courses EN 111 and EN 211</td>
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<tr>
<td>Psychological Research: Statistical Applications (QUAR)</td>
<td>1 course PSY 201</td>
<td></td>
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<tr>
<td>*Social Responsibility in a Diverse World (SOCR)</td>
<td>1 course</td>
<td></td>
</tr>
<tr>
<td>*Integrative Thinking (INTT)</td>
<td>1 course</td>
<td></td>
</tr>
<tr>
<td>*Human Expression (HUME)</td>
<td>1 course</td>
<td></td>
</tr>
<tr>
<td>*Perspectives on Society (PERS)</td>
<td>2 courses</td>
<td></td>
</tr>
<tr>
<td>Introduction to Psychological Science (SCII)</td>
<td>2 courses PSY 100</td>
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</tbody>
</table>

*World Cultures (can double with SOCR, INTT, HUME, & PERS)

**Laboratory Science 1 course of 3 credits or more**

**Other Required Courses Options**

- PSY 100 (4 credits) (SCII)
- PSY 201 (4 credits)
- **Physics (PH) or Chemistry (CH) Elective (3-4 credits) LAB course options: PH 102, PH 201, PH 202, PH 220, PH 221, CH 105, CH 109, or CH 111**

**BI course options:**

- BI 104 (4 credits)
- BI 111 (4 credits)
- BI 203 (3-5 credits)
- BI 207 (4 credits)
- BI 208 (4 credits)
- BI 221 (4 credits)
- BI 225 (3 credits)
- BI 312 (4 credits)

***Take this course Fall or Winter of year indicated.***

**Elective Courses in Major**

- SL 252 American Sign Language I (4 credits)
- SL 253 American Sign Language II (4 credits)
- SL 354 American Sign Language III (4 credits)
- SL 456 Language and Learning Disabilities (4 credits)
- SL 490 Seminar in SLHS
# SPEECH, LANGUAGE & HEARING SCIENCES MINOR

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL 150</td>
<td>Introduction to Speech, Language, and Hearing (F, W)</td>
<td>4</td>
</tr>
<tr>
<td>SL 200</td>
<td>Phonetics (F: SL 150, SL 160, or IP)</td>
<td>4</td>
</tr>
<tr>
<td>SL 351</td>
<td>Intro to Audiology (F: SL 150, SL 160, or IP)</td>
<td>4</td>
</tr>
<tr>
<td>SL 355</td>
<td>Language Development (F: SL 150, SL 200, or IP)</td>
<td>4</td>
</tr>
<tr>
<td>SL 356 OR SL 460</td>
<td>Language Disorders (W: SL 355 or IP) OR Cognition, Communication and Aging (W: PSY 100, Sr. standing or IP)</td>
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</tbody>
</table>

**TOTAL CREDITS REQUIRED** ............................................................................ 20
## DEAF STUDIES CERTIFICATE

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SL 252</td>
<td>American Sign Language I (F,W)</td>
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</tr>
<tr>
<td>SL 253</td>
<td>American Sign Language II (F,W)</td>
<td>4</td>
</tr>
<tr>
<td>SL 354</td>
<td>American Sign Language III (F,W)</td>
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<tr>
<td>SL 358</td>
<td>Deaf Community/Culture (S)</td>
<td>4</td>
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<tr>
<td>SL 360</td>
<td>Deaf History (S)</td>
<td>4</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS REQUIRED** ................................................................. 20

Fall 2016
Additional Policies
PROFESSIONAL SEQUENCE:
(REGISTRATION AND LIABILITY)

1. **Student 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.

2. **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 Risks/Health Insurance

The two most important health hazards of which you need to be aware are AIDS and Hepatitis B. Observing lab safety precautions appropriate for these two risks will generally eliminate any other potential health risks.

AIDS:
The AIDS virus (HIV) is not easily transmitted. Generally you need direct contact with contaminated material and a break in your skin. If you test positive for the antibody to HIV and develop AIDS the situation may eventually be fatal.

However, due to the precautionary measures observed by health care workers, health professionals actually have a much lower incidence of AIDS than the general public does!

Hepatitis B:
This virus is much more stable or "hardy" outside of the body than the AIDS-causing virus. Consequently, it is easier to contract this virus "second hand" so to speak. Counters, test tubes, etc. that were soiled with contaminated fluids can carry the hepatitis virus for long periods of time (6 months) at room temperature. Therefore, it is very important that these surfaces be decontaminated with appropriate cleaning agents frequently. If you develop Hepatitis B, the disease is usually not fatal.

Hepatitis B Vaccine:
If anyone wishes to purchase a Hepatitis B vaccine, this is available at the NMU Health Center. The Recombivax HB Hepatitis B requires three (3) separate inoculations vaccine, the Heplisav two (2) separate inoculations vaccine, or laboratory confirmation of immunity are required for all health professionals.

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.
Advanced Placement 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:

1. Accepts and applies, as appropriate, the NMU Advanced Placement Policy.

2. Allows the student the opportunity to test out of the academic portion of any of the following courses: CLS 100, 109, 190, 150, 200, 201, 202, 203, 204, 213, 214, 251-254, 313, 401, 402, 403, 404, 410, 420, 451-454, 440-443.

3. Allows the student to place out of the practical components of the following courses via documentation that the practical P.O.’s have been met and/or the passing of a practical exam (developed by the instructor): CLS 100, 109, 190, 200, 201, 202, 203, 213, 214.

Sophomore Practicum Advanced Placement

The student must have at least 1 year of full-time experience (in the last 5 years) in a clinical laboratory offering the majority of routine testing in all areas of the lab. The applicant must have worked in all major departments of the laboratory performing 80% of all routine testing. Documentation of this experience is required; the applicant's former supervisor must submit a recommendation and check off the P.O.'s from the sophomore practicum. Clinical Sciences’ faculty assessment will be part of this review if applicants are currently enrolled in Clinical Laboratory Sciences courses.

Applicants for advance placement credit must pass all programmatic academic assessments (tests) for the sophomore practicum courses as stated in #2.

Applicants with six months of full-time experience in a clinical lab (as described above) in a single department may be given advance placement credit for that corresponding component in the Sophomore practicum.

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

The student must have at least two (2) years full time experience (in the last 5 years) in one 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 supervisor must submit a recommendation and check off the P.O.'s from the senior practicum. (Clinical Sciences faculty assessment will be a part of this review if applicants are currently enrolled in clinical lab sciences.)

Applicants for advance placement credit must pass all programmatic academic assessments (tests) for the senior practicum courses and the comprehensive exam as stated in #2. These assessments are administered via a CLS 498 two-credit directed study.

Applicants with 1 year full time experience in a clinical laboratory (as described above) within a single department may be given placement credit for that corresponding component in the senior practicum.

Phlebotomy Practicum Advanced Placement

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

The student must have at least six (6) months full time experience (within the last 2 years) in a hospital which has provided a full-range of phlebotomy experiences and specimen processing. Documentation is required.

Applicants for advance placement credit must pass all programmatic academic assessments (tests) for the phlebotomy practicum courses as stated in #2.
STUDENT APPEALS PROCESS

Please review this section of the University Bulletin at http://www.nmu.edu/records/ for information on advising, counseling, disability support services, health center, transportation, child care, JOBSearch, policies, complaints and appeals.

Students who have complaints concerning grades or other matters should follow the appeals procedure outlines in the NMU Student Handbook at: http://webb.nmu.edu/dso/SiteSections/OurServices/Handbook.shtml. Student complaints concerning grades is found in 1.2.1. Complaints other than grades is in 1.2.2.

To appeal an academic suspension or dismissal from Northern Michigan University, you must complete and mail or fax the appropriate form and any necessary attachments, to the Academic & Career Advisement Center (ACAC). Form can be found at:

http://www.nmu.edu/acac/forms

This form may be submitted at any time, but the form, and any necessary attachments, must be received in the ACAC at least five working days prior to the first day of classes of the semester in which you would like to return. Appeals will be heard by the Admissions and Academic Policies Committee (AAPC) of the Academic Senate. If you need assistance or more information contact the ACAC at (906) 227-2971.

To appeal a grade an appeal form must be completed:

http://www.nmu.edu/acac/academic-suspensiondismissal-appeal-form

This form is to be used in accordance with the procedures for submitting a formal written appeal for adjudication through the grade appeals system as outlined in the Northern Michigan University Student Handbook, under Part I: Student Rights and Responsibilities, Section 1.2.1 Student Complaints Concerning Grades. This form is to be completed in full by the complainant, in typewritten form, and submitted in triplicate to the chairperson of the appeals committee of the department which offers the course in which the alleged grading inequity occurred.

For appeals other than grades, the student may make appeals to the Program Director and/or Associate Dean. Appeals must be written and should explain extenuating circumstances or mitigating factors. The Program Director and/or Associate Dean in consultation with the CLT/CLS Admissions Committee will consider all appeals and render a decision prior to the next available application date.
SCHOOL OF 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 Associates Degree Graduate in Radiography (awarded every May)

Purpose: To recognize the most outstanding graduate of the Radiography Program Associates Degree program based on GPA and the greatest accomplishments in professional growth.

Eligibility:
- A graduating Associates degree student for the academic year.
- Graduate with a 3.0 GPA or higher.
- Received positive evaluations in the radiography 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 program faculty will determine the final choice. There is only 1 selection/year.

Presentation: This award will be presented at the Radiography Program Reception in May of each calendar year. The student will have their name inscribed on a Program plaque. The student will receive an individual certificate-plaque.

Outstanding Associates Degree Graduate in Surgical Technology (awarded every April)

Purpose: To recognize the most outstanding graduate of the Surgical Technology Associates Degree program based on GPA and the greatest accomplishments in 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 surgical technology 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 program faculty will determine the final choice. There is only 1 selection/year.

Presentation: Presented at the Advisory Committee Board Meeting in April each year. The student will have their name inscribed on a Program plaque. The student will receive an individual certificate-plaque.
Applications for Clinical Placements
Application for

Clinical Sciences
&
Surgical Technology
Clinical Sciences & Surgical Technology
Application Form Instructions

Please complete the required forms and submit to the School of Clinical Sciences Secretary, West Science Room 3515 and she 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.


Upon Admission to the Program

The immunization record (both pages) must be completed and the form signed by a physician, nurse practitioner, registered nurse, or other licensed health official. This document will require submission with CastleBranch, which you will receive instructions for upon admission.

You DO NOT need to supply the tuberculin test information at the time of application. The TB test must be given within 6 months of the beginning of your practicum. If you are required to complete a two-step TB test, the tests need to be administered 7-14 days apart with one injection in each arm. Please update your immunization record when the TB test(s) is/are done.

Health insurance policy number must be included on the immunization record.

NOTE: Surgical Technology students must have a baseline eye exam. A signature is required and a copy of the eye exam results must be included with the application.

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.
Date Received: (and/or reactivated)  Name: __________________________
                        Email: __________________________
                        IN #: __________________________

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<th>Practicum Type</th>
<th>Indicate Year</th>
<th>Indicate Year</th>
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<tr>
<td></td>
<td>Summer/Fall</td>
<td>Winter/Spring</td>
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<tr>
<td>Phlebotomy</td>
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<td>Cytogenetics</td>
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<td>Clinical Assistant</td>
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<td>Molecular Biology</td>
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<td>CLT</td>
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<td>DG Practicum</td>
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<tr>
<td>CLS-Lab Medicine</td>
<td></td>
<td>Surgical Technology*</td>
</tr>
<tr>
<td>CLS-Microbiology</td>
<td></td>
<td>Speech, Language &amp; Hearing Sciences</td>
</tr>
</tbody>
</table>

Local Address __________________________
Phone: __________________________

Home Address __________________________
Phone: __________________________

DEADLINE:
December 10 and April 10 for Summer/Fall and Winter/Spring practicum respectively.
*ST deadlines are April 1 and October 1 for August and January practicum respectively.

1. If you hold certification credentials in the health field, please indicate:
   Certification #: __________________________ Date Taken: __________________________

2. Please describe any work experience that may relate to this career interest. (Give name of employer, job description, length of employment, reason for leaving. Use back of page or separate sheet).

3. Why are you pursuing this career interest? (Use back of page or separate sheet).
### 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

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<th>MEASLES</th>
<th>Two immunizations after 12 months of age</th>
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<tr>
<td></td>
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</tr>
<tr>
<td>OR</td>
<td>Documentation of disease by physician</td>
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<tr>
<td>OR</td>
<td>Titer results indicating immunity</td>
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<tr>
<td>OR</td>
<td>One immunization of MMR after 1989</td>
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<table>
<thead>
<tr>
<th>RUBELLA</th>
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<tbody>
<tr>
<td>Immunization after 12 months of age. Date</td>
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<table>
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<tr>
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<th>Recombivax Vaccine series Dates</th>
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<tr>
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<td>Heplisav Vaccine series Dates</td>
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<tr>
<td>OR</td>
<td>Titer results indicating immunity</td>
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<table>
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<tr>
<th>TETANUS/DIPHtherIA</th>
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<td>Tdap Date (within 10 years?)</td>
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<table>
<thead>
<tr>
<th>VARICELLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you had chicken pox? Yes</td>
</tr>
</tbody>
</table>

| OR |
| Titer results indicating immunity |
| OR Varivax Vaccine Two doses Dates |

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

Baseline Eye Exam (For Surgical Technology Students) – Submit a copy of exam results

<table>
<thead>
<tr>
<th>Signature by Optician/Optometrist</th>
</tr>
</thead>
</table>

**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.
Hepatitis B Policy

Hepatitis B Policy Rationale

According to the Centers for Disease Control (CDC) 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 willbe 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 ______________________________________________________________________ Date __________
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.
Application for

Radiography Program
Northern Michigan University  
Radiography Program  
Application for Admission

Name  

Last  
First  
Middle  

Previous Surname(s) ___________________________ (As used on High School and College records)  

University Student IN ___________________________ (Used for identification purposes)  

Present Address  

Street  
City  
State  
Zip Code  

Present Telephone ( ) ___________________________  
Work Telephone ( ) ___________________________  

E-mail Address: ____________________________________________  

Emergency Information: Person to be notified in case of emergency.  

Name ________________________________________________  
Relationship ____________________________________________  

Telephone Number ( ) ___________________________  
Address ____________________________________________  

☐ First Time Application  ☐ Re-application

How did you first hear about our Radiography Program?  

☐ News paper article ☐ Website Search ☐ Mailed Information ☐ Friend/Family Member  
☐ Former Graduate ☐ High School Guidance Counselor ☐ College Advisor ☐ Other

<table>
<thead>
<tr>
<th>Education</th>
</tr>
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</table>
| List all High School, College or University, Technical Schools, or Military attended and award received.  
<table>
<thead>
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<th>School</th>
<th>Address</th>
<th>Dates Attended</th>
<th>Award/Diploma</th>
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<thead>
<tr>
<th>Employment</th>
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</table>
| List all full and part-time work experience beginning with most recent.  
<table>
<thead>
<tr>
<th>Employer</th>
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<th>Supervisor</th>
<th>Telephone</th>
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Community Service / Health Care Experience
List all community service or health care experience beginning with most recent. Be specific in number of contacts, hours per contact, and years of service or experience provided where applicable.

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<th>Date</th>
<th>Organization/Contact Person</th>
<th>Time</th>
<th>Telephone</th>
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Performance Standards

I have reviewed a copy of the Radiography Program’s Performance Standards and Work Capacity and believe I have the abilities to perform these standards satisfactorily.

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Criminal History

In accordance with Michigan State Law for positions that regularly provide direct services to patients, the NMU Radiography Program reserves the right to deny admission to anyone who has been convicted of a crime (misdemeanor or felony) or is pending a criminal charge (excluding minor traffic violations.) It is also understood that conviction of a felony may be grounds for denial of eligibility to complete the ARRT licensure examination.

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I understand that a Criminal Background check will be completed if I am accepted.
I have contacted the ARRT for pre-application review according to Ethical Standards?

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I hereby:

1. Certify that all information provided for the purpose of application is true and correct to the best of my knowledge. I understand that if I knowingly provide false or misleading statements during the application process, I may prevent my acceptance or be cause for my dismissal from the Radiography Program.

2. Authorize the Radiography Program’s Admission Committee the right to view my application for the purpose of determining my qualifications for acceptance.

3. Authorize the Northern Michigan University Radiography Program to investigate my past records and to ascertain any and all information, which may concern my record and character; and release my present and past employers, references, and all persons whomsoever from any damages because of furnishing said information.

If I agree to accept my appointment into the NMU Radiography Program I will abide by all Program policies and regulations.

Signature __________________________ Date __________

The NMU Radiography Program is committed to equal opportunities for all applicants. Our policy is to select student radiographers on the basis of individual merit and ability without discrimination of race, age, color, religion, sex, national origin, disability, veteran’s status, height, weight, marital status, sexual orientation, or gender identity; thus all matters pertaining to the recruitment and education of our students will be free of discriminatory practices.

Northern Michigan University, School of Clinical Sciences, Radiography Program, 1401 Presque Isle Ave, Marquette, Michigan, 49855 (906) 227-2868 or (906) 227-2845.