

# **Clinical Laboratory Science**

## **Graduate Handbook**



**University of North Dakota  
Department of Pathology/Clinical Laboratory Science Program  
School of Medicine & Health Sciences  
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Grand Forks, ND 58202-9037  
<http://www.medicine.nodak.edu/cls>**

**2008-2010**

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## INTRODUCTION

The faculty and staff would like to welcome you to the Master of Science Program in Clinical Laboratory Science.

The purpose of this handbook is to provide you with general information concerning the CLS graduate programs (M.S. in CLS, and CLS Management Certificate) at the University of North Dakota. We encourage you to read through this information to better acquaint yourself with curriculum and policies of the programs. We will discuss the basic process of earning your graduate program degree in this handbook, along with specific program policies and procedures.

Please review the UND Graduate School Handbook for graduate school policies and procedures which can be found at the graduate school website: <http://www.und.edu/dept/grad>. This website should be used to locate graduate school forms and procedures related to your official progress throughout the degree.

## MISSION STATEMENT

The mission of the Master of Science Clinical Laboratory Science (MS, CLS) program at the University of North Dakota is to generate and disseminate an advanced scholarly curriculum through distance and on – campus courses to baccalaureate degreed, certified clinical laboratory science professionals throughout the state, nation and world. The curriculum is designed to prepare graduates for leadership roles in education, consulting, and healthcare administration.

## PROGRAM GOALS

Upon completion of the program the student will be able to:

### **Learning Goal 1:**

**Work independently utilizing critical thinking and problem solving skills to effectively communicate the responsibilities of the clinical laboratory in patient care management to all participants of the healthcare team.**

Specifically, the student will be able to:

Objective 1.1 Analyze and apply research studies and professional literature for applicability to laboratory practices.

Objective 1.2 Demonstrate an ability to apply laboratory based theories and principles to patient care.

Objective 1.3 Create effective interactions with members of the healthcare team.

### **Learning Goal 2:**

**Apply theories of laboratory management including financial, quality, and personnel management.**

Specifically, the student will be able to:

- Objective 2.1 Evaluate laboratory financial management processes and applications.
- Objective 2.2 Examine quality management processes and applications.
- Objective 2.3 Plan, develop and organize laboratory services while effectively addressing costs.
- Objective 2.4 Examine personnel management processes and applications

**Learning Goal 3:**

**Demonstrate knowledge of advanced scholarly curriculum that encompasses the scope of practice in clinical laboratory science.**

Specifically, the student will be able to:

- Objective: 3.1 Analyze advanced theories, principles, and laboratory skills in each discipline of the clinical laboratory science profession.
- Objective 3.2 Assess methodologies and interpretation of data within the Clinical Laboratory Science scope of practice.

**Learning Goal 4:**

**Demonstrate effective communication skills, both oral and written, across multiple topic or disciplines.**

Specifically, the student will be able to:

- Objective 4.1 Demonstrate scholarly writing skills through the successful completion of papers, case studies, written evaluations, and comprehensive examinations.
- Objective 4.2 Demonstrate oral communication skills by successfully creating and presenting scholarly work to faculty and students of the School of Medicine and Health Sciences.

## **ADMISSION**

**Admission to the University of North Dakota:**

Follow the General Graduate School Admissions Requirements

<http://www.graduateschool.und.edu/html/admissionshome.html>. The Graduate Records Exam is not required for entrance into the Clinical Laboratory Science Program.

**Admission Status Levels:**

Upon admission to the graduate school you will be assigned an admission status. The following admission statuses are available: approved status, qualified status, provisional status, deferred admission status. For further clarification of these classifications, see the Graduate School website.

**Admission to the Clinical Laboratory Science Masters Program:**

- BA or BS degree and successful completion of either the CLS (NCA) or MT (ASCP) certification examination. Proof of the certification award must accompany the application.
- Prior experience in a medical laboratory is recommended.
- The graduate records exam is not required.
- TOEFL (required by all non-native English speaking individuals).  
 Applicants must achieve a minimum score of 550 (paper-based), 213 (computer-based) or for the internet based TOEFL the minimum scores for each category (speaking 23/30, listening 19/30, and writing 15/30) to be considered for admission. UND recognizes the IELTS test with a minimum overall band score of 6.5 or successful completion of English Language Service (ELS) level 112 as equivalent to TOEFL. This test must be sent directly from ETS – photocopies are not accepted. The TOEFL or equivalent requirement will not be waived for any reason and the test scores older than two years are no longer valid. Applicants who have received a bachelor's degree or higher from the United States or English-speaking Canada are not required to fulfill the English test requirement.

The entering class will be chosen from all qualified applicants on the basis of the quality of the applicants' previous work and the adequacy of their preparation for graduate study at UND. The Graduate School reserves the right to refuse admission to any applicant on the basis of scholastic or other reasons.

Review the curriculum requirements, electives available, and schedule rotation of classes in the following section of the handbook. This information is also available on the CLS website <http://medicine.nodak.edu/cls>. Registration information for the current semester is also available on our website in the upper right corner announcement section at least four weeks before the start of a new semester.

## **PROGRAM REQUIREMENTS**

### **Non-Thesis Option:**

Master of Science in Clinical Laboratory Science is considered a non-thesis option graduate program. Advanced scholarly work will include the independent study and the comprehensive exams.

### **Course Requirements:**

A minimum of 32 semester credits is required for the degree. The total credits include two credits in the major for an independent study report for which the student registers for the course number 997. The program may include just the major, the major, and a minor, or a major and a cognate area. The major must include at least 28 credits for the major department and a minor or cognate area must include at least nine credits. A minor is difficult to acquire unless the student is taking credits on the University of North Dakota campus. A minor requires nine semester credits from one department. A

cognate requires nine semester credits, but courses can be taken in more than one department. The total number of graduate credits that can be transferred into UND is eight semester credits.

### **Transfer Requirements:**

A limited amount of the graduate work completed at a regionally accredited North American institution prior to or after matriculation in the Graduate School at UND, may be applied toward a graduate degree at the University of North Dakota. Graduate work is considered for transfer only on an individual basis and only after the student has completed satisfactory work in residence at UND. Those transfer credits, approved by the student's advisor and the Dean of the Graduate School, are included in the program of study for the UND graduate degree and only those transfer credits will be recorded on the UND transcript.

The basic purpose of the transfer policies is to ensure that transferred work is of comparable, content, level, timelines, and quality to that which would be taken at UND and included on the program of study for the degree. The following policies are generally applicable to the acceptance of the graduate work for transfer to UND:

- The work must have been taken at an accredited North American institution.
- The student must have been enrolled as a Graduate Student.
- The work must have received graduate credit at the institution where it was earned.
- The student must have earned a grade of B or better.
- The work must be less than seven years old at the time the UND degree is awarded with the exception of work that was part of a completed prerequisite degree.

**The amount of transfer credit that will be accepted toward the master's degree is one – fourth, eight semester credits, of the total credits hours required for the degree.**

## **GRADUATE TEACHING ASSISTANTSHIPS**

Graduate Teaching Assistantships (GTA) are university appointments that provide financial assistance to students qualified for teaching service in the department in which they take the major part of their graduate work. The purpose of these assistantships is to facilitate students working toward their degree while gaining teaching experience in the field of the degree. Appointments may be for one-fourth or one-half of service. Most assistantships are half-time assistantships which require 15 to 20 hour of work per week and permit the student to carry a minimum of six and a maximum of ten credits of graduate work each semester. A quarter-time assistant requires seven and a half to ten hours per week and must carry eight to 12 credits per semester.

The tuition is waived by the University. Students are responsible for all other fees. A health insurance plan is also available.

International graduate assistants who are non-native English speaking individuals are required to take the TSE (Test of Spoken English) or the SPEAK test and achieve a score of 50 before an assistantship may be offered. If a graduate assistant has taken the internet-based TOEFL (IBT), ask the Graduate School what score is required.

To inquire about graduate teaching assistantships within the CLS program contact Ruth Paur, Graduate Program Director, via e-mail [ruthpaur@medicine.nodak.edu](mailto:ruthpaur@medicine.nodak.edu). We have limited positions available for students wanting to experience clinical laboratory science teaching opportunities on-campus at the University of North Dakota.

## **ADVISOR APPOINTMENT**

Upon acceptance into the program the student will be assigned an advisor by the MS CLS program director. You will receive notification of your advisor from the Graduate School and the information will include the advisor's name, email address and telephone number.

## **STUDENT AND FACULTY RESPONSIBILITY**

It is the *responsibility of the student* to become informed and to observe all regulations and procedures required by the university, graduate catalog and the program in which the student is enrolled. The student is responsible for reading the graduate catalog, all contracts for employment, the terms and conditions of any awards and correspondence from various offices of the University. The student is responsible for knowing his/her academic standing and grade point average. While the Graduate School attempts to notify students regarding any problems in the student's progress toward a degree, the student alone is responsible for maintaining satisfactory academic standing and progress. The Graduate School expects all students and faculty to be aware of its policies and procedures. Ignorance of a rule does not constitute basis for waiving that rule.

## **GRADUATE LISTSERV**

The Graduate School would like to keep you informed of important dates, deadlines, and news. As a graduate student you are invited to subscribe to the Graduate Student Announcement e-mail list.

To subscribe, send an e-mail to [listserv@listserv.nodak.edu](mailto:listserv@listserv.nodak.edu)

Do not enter anything in the Subject Line.

In the Body of the mail, type the following: SUB UND – GRAD – STUDENTS (your first name your last name)

Example: SUB UND – GRAD – STUDENTS Ruth Paur.

## GETTING STARTED IN THE CLS PROGRAM (GRADUATE LEVEL)

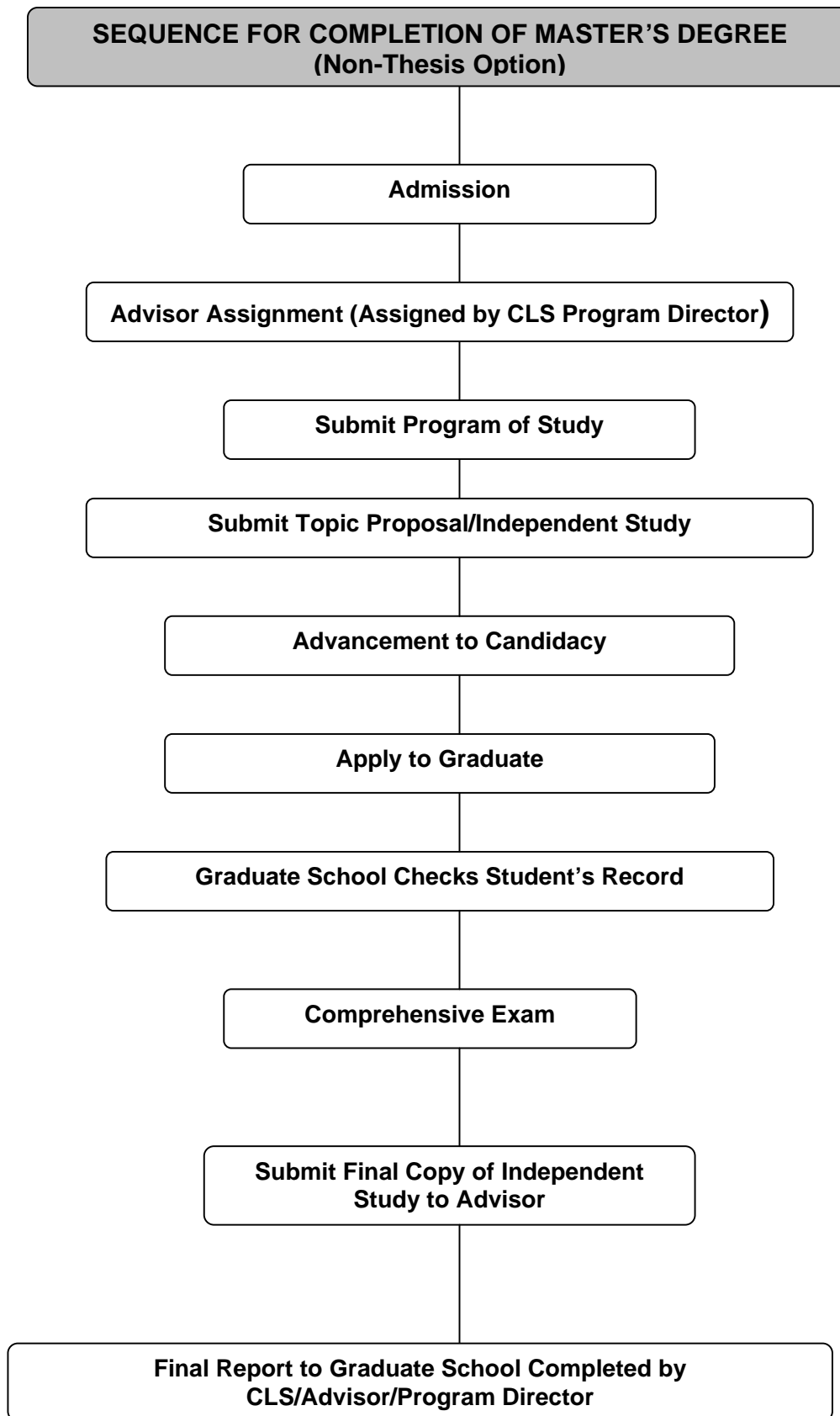
1. **Admission:** Upon admission to the University of North Dakota, and acceptance of your graduate school admission request you will be eligible to enroll in course work within the CLS graduate program. At the time of admission to UND you will be notified of your EMPL ID# (sometimes called Student ID#). The EMPL ID# serves as your unique identification number. Keep this number handy as you will need it often while enrolled as a graduate student and it must be listed on all forms submitted to the graduate school.
2. **Advisor:** Upon acceptance into the program the student will be assigned an advisor by the MS CLS program director. You will receive notification of your advisor from the graduate school and it will include the advisor's name, email address and telephone number.
3. **U-Mail:** Upon admission to the University of North Dakota you will be issued a UND U-Mail e-mail account. This e-mail account will remain active while you are enrolled as a student at the University of North Dakota. To access this account go to <http://www.und.edu>. You will need to activate this account and check it for official University of North Dakota correspondence.
4. **Semester Course Offerings:** Four to six weeks prior to the start of the fall and spring semester, the course offerings with brief descriptions and instructions will be posted on the CLS website in the upper right corner. This online announcement serves to inform you of upcoming semester offerings and registration information needed, textbook requirements, etc. Any questions concerning registration should be directed to the CLS administrative assistant Mary Beth at [mcgurran@medicine.nodak.edu](mailto:mcgurran@medicine.nodak.edu).
5. **Course Registration:** To register for course work you will need to access the universities online enrollment system (Connect ND/Campus Connection <http://www.und.edu/dept/registrar/campusconnection/index.htm>.) The system is used for enrollment and also individual student status. You will be issued a User ID and Password when you apply for admission to UND. Additional directions for accessing Campus Connection are available on the UND website. Campus connection is also to be utilized for viewing final semester grades.
6. **Blackboard:** The platform used for the online course classroom is through the system "Blackboard". At the beginning of your first semester as a CLS graduate student you will be assigned a Blackboard username and password. This username and password will be issued within the first week of classes and sent via e-mail to an on file e-mail account. This username and password is used to access the course classroom within Blackboard at the UND School of Medicine. Final semester grades should be viewed on UND Campus Connection. If you experience difficulty accessing Blackboard, contact Lucy Zheng at [lzheng@medicine.nodak.edu](mailto:lzheng@medicine.nodak.edu) for assistance.

7. **Medicine E-mail Account:** In addition to the Blackboard username and password, you will be issued a medicine.nodak.edu e-mail address early within your first semester. *Upon issue, this e-mail address will become the e-mail address the CLS program faculty and staff will use to contact you with any correspondence, announcements and general information.* Please check it often or at least once a week and use this account to contact us.
8. **Computer Requirements:** The majority of the curriculum in the graduate program is delivered in an online format. Since this format requires both a computer and internet connection we have some recommendations when choosing technology features to meet the demands of being a graduate student. The internet connection should be high-speed broadband, cable, satellite, or DSL. While a dial-up connection may be functional, you will be hindered with the download speed. You will need to download lectures to your hard drive (through the zip format for each lecture) to view the online lectures without intermittent delays.

Computer Specifications: (Recommended):

- CPU Intel Pentium 4 Processor 2.2 Ghz or AMD 2200+ Athlon XP or higher
- Memory 1 GB (512 MB acceptable)
- Storage 60-80 GB (minimum)
- Media Storage: 48X CD – ROM or CD R/W
- Graphics Card: 64 MB memory video card (minimum recommendations)
- Audio: Sound card with speakers
- Software: Microsoft Windows XP, Microsoft Office Suite

The CLS program does not require students to purchase a personal or laptop computer while enrolled in the program. Since this program is delivered in an online format, you will need to have the means to readily access course materials via the internet learning systems. All questions on this topic should be directed to Janna Schill, [jschill@medicine.nodak.edu](mailto:jschill@medicine.nodak.edu).



## CHECKLIST

This is designed as a tool for you to follow your progress within the MS CLS program.

- \_\_\_\_\_ Apply for admission to the UND CLS Graduate School as a MS in CLS degree seeking student.
  
- \_\_\_\_\_ Advisor: Upon acceptance into the program the student will be assigned an advisor by the MS CLS program director. You will receive notification of your advisor from the graduate school and it will include the advisor's name, email address and telephone number.
  
- \_\_\_\_\_ Review course offering information "Rotation Schedule" from the CLS website: <http://medicine.nodak.edu/cls>
  
- \_\_\_\_\_ Register for your fall or spring semester courses by viewing "Schedule of Graduate Classes" on the CLS website: <http://medicine.nodak.edu/cls>. The information listed will include the class # used to register for your courses, instructor, textbook(s) required, when courses begin on Blackboard, etc. The schedule also explains the UND billing process and other useful information on a semester by semester basis within our program. **For fall semester courses the information will be available in late July and for spring semester courses the information will be available in late November.**
  
- \_\_\_\_\_ Complete the CLS program advising sheet included at the end of this handbook. This is created by the CLS program to allow you to make a tentative sketch of your program of study and the projected semesters you are intending to enroll in specific courses. You will want to view the rotation schedule to help in your planning. It is for your purposes only and does not need to be submitted. Or you can use the official program of study form from the Graduate School for this purpose. Note: No official coursework is completed during the summer semester but feel free to visit with your advisor concerning preparation for directed studies, seminar and independent project if you are thinking about beginning them ahead of time.
  
- \_\_\_\_\_ Discuss with your advisor your plans to complete the requirement of two credits of CLS 591 Directed Studies. The completion of the two credit requirement can be accomplished two different ways. A more complete explanation can be found in this handbook. You will want to decide what your plan entails before you submit your Program of Study to the Graduate School.
  
- \_\_\_\_\_ Seminar: CLS 521 Seminar is a course you will want to be thinking about. A student usually registers for this course during a semester they have registered for an on campus laboratory course requirement. The student will present their seminar, on campus, during the one week time they are registered in the laboratory course. Course recommendation: View an on campus seminar

before registering for the course. If you have any questions contact Janna Schill (instructor) or your advisor.

\_\_\_\_\_ Submit your program of study (Recommended: Second Semester) to your advisor. Additional information on program of study can be found in this handbook. Note: Your program of study must be approved at least one semester before you are advanced to candidacy.

\_\_\_\_\_ Submit a Topic Proposal (CLS 997 Independent Study) for approval.) (As early as possible, but no later than the semester before you plan to graduate.) Your proposal of a topic for an independent study must be approved by your advisor and the Dean of The Graduate School before you can become a candidate for your degree. You cannot graduate in the same semester or summer session in which you become a candidate and therefore you must receive approval on your proposal prior to your final semester. The Graduate school will send approval or rejection copies to the student, advisor and department.

\_\_\_\_\_ Discuss ideas with your advisor

\_\_\_\_\_ Submit IRB form for approval if necessary

\_\_\_\_\_ Submit form

See more specific information under this section displayed in this handbook.

\_\_\_\_\_ Advance to Candidacy (You must be advanced to candidacy the semester before you plan to graduate. When you have received approval of your program of study, and your topic proposal, and you have completed at least 12 credits with a 3.0 GPA you will be advanced to candidacy. You will be mailed a status sheet from the graduate school along with a graduation application at this time.)

\_\_\_\_\_ Apply to Graduate (You must submit the form by the published deadline for the term in which you plan to graduate). An application will be mailed to you from the graduate school when you are advanced to candidacy.)

\_\_\_\_\_ Complete Your Comprehensive Exams (Check with the CLS program and/or your advisor for this requirement.) Detailed information concerning the comprehensive exam process is found later in this handbook and includes a form, "Request for Comprehensive Exams" located near the end of this handbook.

\_\_\_\_\_ Submit the final copy of your Independent Study (CLS 997) to your advisor. (Check with your advisor so that he/she will have sufficient time to read before Final Report on Candidate form is required to be completed).

\_\_\_\_\_ The form "Final Report on Candidate" is submitted to the Graduate School by the published deadline for the term in which you plan to graduate.  
○ *The CLS Program and your academic advisor will complete and submit this report for the student by the published deadline.*

## HELPPFUL HINTS

- \_\_\_\_\_ HELPFUL HINT #1: Always, Always, Always include your UND Student ID# (sometimes called EMPL ID#) on all forms where it is required.
  
- \_\_\_\_\_ HELPFUL HINT #2: Be sure to monitor your medicine email account on a weekly basis throughout the degree seeking process. Your medicine email account will be the form of electronic communication used to contact you by the CLS faculty and staff.
  
- \_\_\_\_\_ HELPFUL HINT #3: Always update your personal information on UND campus connection (address change, etc). Campus Connection is the official UND connection used to locate you.
  
- \_\_\_\_\_ HELPFUL HINT#4: The graduate school requires a student to be registered in a course the semester they have applied for graduation. If you have completed all of your course requirements in previous semesters you would register for CLS 996 Continuing Enrollment. There is a \$100 course fee CLS 996 Continuing Enrollment which would be the tuition charged for that semester. Plan your program of study so that you have a course left to register for your last semester. An example would be that you would register for CLS 997 Independent Study the semester you are graduating.
  
- \_\_\_\_\_ HELFUL HINT#5: Schedule an in-person advisement session with your advisor. It is helpful for a student to schedule an on campus advisement session with their advisor when they are on campus for a course (lab, seminar, etc). The student might wish to use the form on page 34 to plan for their advisement session. It is helpful for the student to bring this form with them to the advisement session. This will also help the student to complete their program of study form, if they have not done so already.
  
- \_\_\_\_\_ HELPPFUL HINT#6: Always remember to view your official semester grades on the UND system Campus Connection. The grade entered on Campus Connection will be the official grade placed on your official UND transcript. The Blackboard program we use to teach and administer the course online for you is not the place to view your final official semester grade.
  
- \_\_\_\_\_ HELPFUL HINT #7: Graduate School forms are located on the graduate school website: <http://www.und.edu/dept/grad/html/forms.html>
  
- \_\_\_\_\_ HELPFUL HINT #8: The official Graduate School Handbook is available online: [http://www.graduateschool.und.edu/docs/MastersHandbook2007\\_web.pdf](http://www.graduateschool.und.edu/docs/MastersHandbook2007_web.pdf)
  
- \_\_\_\_\_ HELPFUL HINT #9: Graduate School website: <http://www.und.edu/dept/grad/>

## CURRICULUM REQUIREMENTS

### Master of Science Clinical Laboratory Science Program

<u>Course #</u>	<u>Course</u>	<u>Credit</u>
CLS 501	Quality Assurance in the Clinical Laboratory	2
CLS 502	Erythrocytes in Health and Disease	2
CLS 503	Leukocytes in Health and Disease	2
CLS 504	Medical Microbiology for Laboratory Professionals	2
CLS 505	Financial Management of the Clinical Laboratory	2
CLS 506	Clinical Chemistry	2
CLS 507	Clinical Immunohematology	2
CLS 513	Advanced Clinical Immunology for Laboratory Professions	2
CLS 515*	Capstone Course in Clinical Laboratory Science	2
CLS 518	Molecular Diagnostics	2
CLS 521**	Seminar	1
CLS 591***	Directed Studies	2
CLS 997	Independent Study	2

Three of five laboratory courses are required:

CLS 510*	Erythrocytes in Health and Disease Laboratory	1
CLS 511*	Leukocytes in Health and Disease Laboratory	1
CLS 512*	Immunohematology Laboratory	1
CLS 519*	Molecular Diagnostics Laboratory	1
CLS 520*	Medical Microbiology Laboratory	1

Electives Available:

CLS 508	Leadership and Conflict Resolution in Health Science	2
CLS 509	Laboratory Education Methodologies	2
CLS 514	Computer Applications in Clinical Laboratory Science	2
CLS 517	Health Care Administration for the Clinical Laboratory Profess	2

Courses are offered on a three year rotation. If a specific course is needed due to extenuating circumstances or pending graduation, additional course offerings may be made available to a specific student with the instructor's permission. Discuss options with your advisor.

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\* One week on campus course, not available by distance learning.

\*\* On campus course taken near the end of your program of study. Not offered by distance learning. The course should be taken within the last two semesters of program completion.

\*\*\* Two credits of directed studies are required. CLS 591 Directed Studies Case Studies is usually a one credit course. See Directed Studies information section of this handbook for more detailed information.

## ROTATION SCHEDULE OF CLS GRADUATE COURSE OFFERINGS Fall 2008-Fall 2010

(Located on the UND CLS Website, Updated Annually, Subject to Change)

### Fall 2008

CLS 501**	Quality Assurance in the Clinical Laboratory .....	2
CLS 504	Medical Microbiology for Laboratory Professionals .....	2
CLS 508**	Leadership & Conflict Resolution in the Health Sciences.....	2
CLS 591	Directed Study: Case Studies in CLS.....	1
CLS 997	Independent Study.....	2

### Spring 2009

CLS 503	Leukocytes in Health and Disease .....	2
CLS 505**	Financial Management of the Clinical Laboratory .....	2
CLS 511*	Leukocytes in Health and Disease Laboratory.....	1
CLS 515*	Capstone Course in Clinical Laboratory Science.....	2
CLS 517**	Health Care Administration for the Clinical Laboratory Professional.....	2
CLS 518	Molecular Diagnostics.....	2
CLS 521*	Seminar .....	1
CLS 591	Directed Study: Case Studies in CLS.....	1
CLS 997	Independent Study.....	2

### Fall 2009

CLS 513	Advanced Clinical Immunology for Laboratory Professionals .....	2
CLS 514**	Computer Applications in Clinical Laboratory Science .....	2
CLS 519*	Molecular Diagnostics Laboratory .....	1
CLS 520*	Medical Microbiology Laboratory.....	1
CLS 521*	Seminar .....	1
CLS 591	Directed Study: Case Studies in CLS.....	1
CLS 997	Independent Study.....	2

### Spring 2010

CLS 501**	Quality Assurance in the Clinical Laboratory .....	2
CLS 502	Erythrocytes in Health and Disease .....	2
CLS 508**	Leadership and Conflict Resolution in the Health Sciences .....	2
CLS 510*	Erythrocytes in Health and Disease Laboratory .....	1
CLS 515*	Capstone Course in Clinical Laboratory Science.....	2
CLS 521*	Seminar .....	1
CLS 591	Directed Study: Case Studies in CLS.....	1
CLS 997	Independent Study.....	2

### Fall 2010

CLS 505**	Financial Management of the Clinical Laboratory .....	2
CLS 506	Clinical Chemistry .....	2
CLS 509	Laboratory Education Methodologies.....	2
CLS 517**	Health Care Administration for the Clinical Laboratory Professional.....	2
CLS 591	Directed Study: Case Study in CLS .....	1
CLS 997	Independent Study.....	2

Available any semester:

CLS 591	Directed Study: (Individual Specified Topic Title – Contact Advisor.....	1
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\*Not available by distance learning. Distance learning courses are WEB based.

\*\*Required course for Clinical Laboratory Science Management Certificate.

## COURSE DESCRIPTIONS

**501. Quality Assurance in the Clinical Laboratory.** 2credits: The course will consist of lectures, readings and case studies of quality assurance for the clinical laboratory.

**502. Erythrocytes in Health and Disease.** 2 credits: This course is the study of the erythrocyte. It includes discussions of the normal red cells with emphasis on molecular structure, molecular function, production and regulation. The course continues with studies of the molecular basis of the diseases of the erythrocyte. Role of the laboratory in the diagnosis of these conditions is stressed and current research tools are included.

**503. Leukocytes in Health and Disease.** 2 credits: This course presents the normal and abnormal structure and function of each of the peripheral blood leukocytes. Emphasis is on the molecular level, light and electron microscopic evaluation and the role of the laboratory in diagnosis of each condition.

**504. Medical Microbiology for Laboratory Professionals.** 2 credits: This course will cover the study of human pathogenic microbes including bacteriology, parasitology, virology, mycology and antimicrobial agents. The information presented will include beginning through advanced knowledge and include both traditional and molecular identification.

**505. Financial Management of the Clinical Laboratory.** 2 credits: This course presents an overview for financial management of clinical laboratories. Students learn several basic financial operation concepts, how to evaluate productivity and how to manage salaries, wages and supply inventories for maximum cost containment. Students learn how to plan for capital expenditures, set laboratory fee rates and plan an implement budget.

**506. Clinical Chemistry.** 2 credits: This course addresses the complex and difficult problems that have arisen as a byproduct of the effort to make effective use of the resources of analytical chemistry in support of the practice of medicine.

**507. Immunohematology.** 2 credits: A detailed study of the blood groups of man and laboratory aspects of blood banking with special reference to theoretical and clinical applications.

**508. Leadership and Conflict Resolution in the Health Sciences.** 2 credits: The course will provide basic and advanced training in becoming an effective leader in health service professions. Students will learn emotional intelligence skills that support leadership, how to mediate conflict through a transformative process, and problem solving facilitation techniques. In addition, students will learn how to apply their new skills for more effective living.

**509. Educational Methodologies in Laboratory Science.** 2 credits: This course will include information concerning the creation of instructional and evaluative material for

teaching clinical laboratory science. Classroom management techniques and the peer review process for instructors will also be included.

**510. Erythrocytes in Health and Disease Laboratory.** 1 credit: Laboratory evaluations of disorders of erythrocytes are presented using a case study approach. Blood and bone marrow smears are provided for morphologic study. Selected special stains and procedures are performed and discussed.

**511. Leukocytes in Health and Disease Laboratory.** 1 credit: This course is the study of the leukocyte. It includes discussions of the normal white cells with emphasis on molecular structure, molecular function, production and regulation. The course continues with studies of the molecular basis of the disease of the leukocyte. The role of the laboratory in the diagnosis of these conditions is stressed and current research tools are included.

**512. Immunohematology Laboratory.** 1 credit: This lecture/laboratory course is intended for beginners or experienced medical technologists desiring a refresher course in immunohematology. The curriculum includes resolving ABO discrepancies, utilizing enhancement techniques for antibody identification, solving problems in compatibility testing, determining neonatal and obstetrical transfusion practices, and identifying new trends in blood banking. It is designed as a one week course with 40 contact hours including ten hours of lecture and 30 hours of laboratory.

**513. Advanced Clinical Immunology for Laboratory Professionals.** 2 credits: Prerequisites consent of instructor. Broad array of topics which will stretch from introductory level immunology to the current research and applications of that research in the modern clinical laboratory.

**514. Computer Applications in Clinical Laboratory Science.** 2 credits: This course is designed to provide students with knowledge of computer usage in Health Sciences. It will include hardware configuration, software applications in health care and online searching of periodicals. Instruction will be primarily online and require specific computer requirements.

**515. Capstone Course in Clinical Laboratory Science.** 2 credits: Prerequisites: Completion of at least 20 credits in the Clinical Laboratory Science Master of Science Program. The Capstone Course in Clinical Laboratory Science (CLS) provides the student with a number of tools that they can use in their leadership roles in the CLS profession. The student will learn basic facilitation skills of leading meetings and solving problems in the work place. The student will develop their own professional web page and learn how to create web pages for their business or place of employment. They will learn about important computer applications such as Visual Basic, Excel and PowerPoint. The student will learn about informatics in the health sciences including applications of internet use, streaming technology and Blackboard teaching software.

**516. Special Topics 1-4 credits:** Topical Courses in laboratory medicine organized on a semester by semester basis.

**517. Health Administration for the Clinical Laboratory Professional. 2 credits:** Overview of the organization and financing of health care services including an examination of the philosophical, political, and economic foundations underlying the US health care system. Students also will be introduced to a myriad of health care administration resources and case studies, including decision tools for adopting new technology and quality improvement strategies.

**518. Molecular Diagnostics. 2 credits:** An overview of specific molecular biology application in the laboratory and a discussion of cell biology, DNA chemistry, genetics, nucleic acid extraction and modification, blotting, polymerase chain reaction, and probes in relation to diagnostic investigations.

**519. Molecular Diagnostics Laboratory. 1 credit:** Focused application of molecular techniques including operation of equipment, DNA extraction and measurement, blotting, polymerase chain reaction, and utilization of probes.

**520. Medical Microbiology Laboratory. 1 credit:** This course includes the structural, biochemical and immunological identification of human pathogens and the elimination or confirmation of organisms utilized in biological terrorism.

**521. Seminar. 1 credit:**

**591. Directed Study in Laboratory Medicine. 1 credit:** Prerequisite: Consent of advisor. Designed to meet the needs of individual students in laboratory medicine.

**997. Independent Study. 2 credits:** The independent study is designed to require the student independently to investigate a topic related to the major field of study.

## LEAVE OF ABSENCE AND READMISSION

Effective July 1, 2007, degree and certificate seeking graduate students who wish to take a leave of absence from their program for Fall or Spring semester must notify their graduate program and the Graduate School by submission of a *Request for Leave of Absence from Graduate Study* in advance of their leave. Students will be required to obtain departmental approval prior to submitting the form to the Graduate School. Summer semester is not counted as a break in enrollment.

Students who do not submit a leave of absence will be required to submit a *Readmission Application for Graduate School* and pay a readmission application fee of \$25.00. Applications for readmission will be reviewed and approved by the program and the graduate dean.

These forms can be located at: [www.graduateschool.und.edu](http://www.graduateschool.und.edu)

## INCOMPLETE GRADE POLICY (UND OFFICE OF THE REGISTRAR)

It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student's control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark "I," Incomplete, shall be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor. Incomplete grades are entered on the final grade sheet. Incomplete grades convert to grades of "F" if a grade change is not submitted by the instructor to the Office of the Registrar by the specific due date.

### **Option 1:**

The final grade must be submitted by the instructor within two calendar months of the original course completion date or by an earlier date specified on the incomplete form by the instructor. (Example: If original course took place in the spring or summer semester, the incomplete is due two calendar months into the following fall semester.)

### **Option 2:**

An incomplete may be extended for up to twelve calendar months by submitting a petition to the Office of the Registrar. This petition requires approval by the instructor of the course and the Dean of the Graduate School before it is submitted.

An incomplete grade must be changed by twelve calendar months from the ending date of the class. An "I" may be converted as indicated above but cannot be expunged from the record. Students may not register in courses in which they currently hold grades of incomplete, except for courses that allow repeated enrollment. A student will not be allowed to graduate with an unconverted incomplete grade on the academic record.

**Note: It is the student's responsibility to keep the instructor informed of their progress concerning any incomplete grade that was assigned to them so that the incomplete grade can be removed and a grade assigned by the instructor according to the above policy deadlines. If this does not occur the grade will automatically convert to a grade of F by the Office of the Registrar.**

## **DIRECTED STUDIES INFORMATION (CLS 591)**

Two credits of directed studies (CLS 591) are required for the Masters of Science in CLS degree. The purpose of directed studies is to assist the student in pursuing scholarly information or completing a scholarly project that is of a particular interest. Routinely, a direct studies project is for one graduate credit. Large scale/scope projects can be assigned two credits upon approval by the academic advisor prior to enrollment of the course.

Your CLS 591 Directed Studies is a separate course from your independent project (CLS 997 Independent Study) which is a much larger scale accomplishment than the directed studies. An example of the depth of an independent project may be the creation of an entire course to teach including the: syllabus, lectures, quizzes, study guides, projects, laboratory experiences, and exams. The size of a directed study would be the creation of the ten laboratory experiences or participating in the case studies course for one credit. For details concerning CLS 997 independent Study, see the respective section within this handbook.

The two credit requirement of CLS 591 Directed Studies is usually fulfilled by the student participating in at least one case studies course and on optional specific topic, although any combination is acceptable. (Example: two case study courses or two optional topics.) The optional specific topic would be determined between the student and their advisor. Individuals have created: employee training modules (CLS 591 Directed Studies: Employee Training), competency testing in micro (CLS 591 Directed Studies: Competency testing in Microbiology), a study of particular financial aspect of the laboratory (CLS 591 Directed Studies: Inventory Control in the Medical Laboratory) etc. You may have a particular interest in the development of a particular project or an investigation into a specific topic. If you wish to choose this option, contact your advisor for further discussion.

CLS 591 Directed Studies: Case Study in CLS is available both fall and/or spring semesters. If a student wishes to work on a case study during the summer, contact your advisor and Ruth Paur [ruthpaur@medicine.nodak.edu](mailto:ruthpaur@medicine.nodak.edu), who is the case studies instructor.

### **Grading:**

Successful completion of the course will be determined by the instructor of the course. Specific grading criteria will be determined by the instructor and available during the second week of the semester.

## SEMINAR INFORMATION

The purpose of the seminar is to increase professional level skills in creating and presenting information related to patient health and disease with the correlation to the medical laboratory.

Students attend fellow student seminar presentations during their first laboratory experience on campus and present their own seminar when they return to campus for other laboratory and/or capstone courses. Specific instructions will be given to the student when they are enrolled in the course the semester of presentation by the instructor, Janna Schill.

Generally, the seminar should be 45-50 minutes in length and presented using PowerPoint or a similar professional presentation platform. Included in the presentation should be objectives, reference information, and audience handouts.

For further information contact Janna Schill [jschill@medicine.nodak.edu](mailto:jschill@medicine.nodak.edu), the instructor of the course, and/or your advisor.

## PROGRAM OF STUDY

Your program of study is a listing of the courses and credits you need to take in order to meet the requirements of your degree. In addition to a major, some students elect to obtain a minor (a concentrated study in a specific supporting field) or to take courses in a cognate area (a selection of courses providing broad support to the major). It is not possible to obtain a minor in the CLS MS program unless you are taking all of your courses on campus. For the nine credits needed to obtain a minor, all of the courses must be taken within one department outside of CLS. A cognate can be earned with nine credits in one topic area (such as education), but can be earned through transfer work (eight credits maximum) and courses from more than one department. The courses for a major, minor, and/or cognate are to be included in your program.

It is the student's responsibility to know what the course and credit requirements are for your program. Consult with your advisor when preparing your program of study.

**Instructions:** [http://www.und.edu/dept/grad/docs/POS\\_Instructions\(Masters\).doc](http://www.und.edu/dept/grad/docs/POS_Instructions(Masters).doc)

**Form:** (This form must be word processed.)  
[http://www.und.edu/dept/grad/docs/Master\\_POS\\_rev5\\_06.doc](http://www.und.edu/dept/grad/docs/Master_POS_rev5_06.doc)

### Signatures:

Your advisor and the graduate program director must sign your program of study. If you are not on campus you may fax the form to the CLS office and we will gather the signatures and forward the form to the graduate school on your behalf.

## **TOPIC PROPOSAL/INDEPENDENT STUDY INFORMATION (CLS 997 INDEPENDENT STUDY)**

(Time frame: As soon as possible, but not later than the semester prior to your final semester)

Your proposal of a topic for an independent study must be approved by your advisor and the Dean of The Graduate School before you can become a candidate for your degree. You cannot graduate in the same semester or summer session in which you become a candidate and therefore you must receive approval on your proposal prior to your final semester. The Graduate school will send notification of approval to the student, advisor and department.

### **Plan Your Topic Proposal:**

The Independent study is designed to require the student independently to investigate a topic related to the major field of study. The study need not be an original contribution to knowledge but may be a presentation, analysis, and discussion of information and ideas already in the literature of the field. The requirement is to ensure a student can investigate a topic and organize a scholarly report on the investigation.

Approval is affected by the student's completion of a form entitled, "Topic Proposal of Independent Study." This form is available, with instructions, on the Graduate School website. Student's must prepare and secure their advisor's approval. Upon approval by the advisor, the CLS program will forward the form to the Dean of the graduate school in order to secure the Dean's approval.

### **Creating the Proposal:**

The independent project must be a large scholarly project. The comprehensive exams and your independent project are submitted in place of the thesis as a culmination to your graduate program.

### **Types of Projects:**

The student must discuss their ideas with their advisor, who will assist them in judging whether the project must be narrowed or expanded in scope to reflect the scholarly level demanded of an independent project. The advisor will work with the student for any scheduled reviews during the process of creating the project. An advisor may ask for assistance from another UND graduate instructor for help with a particular topic in the laboratory; specifically, hematology, chemistry, immunohematology, microbiology, etc.

Examples of previous independent projects include:

- Creating an entire college course, including syllabus, objectives, lectures, study guides, quizzes, and exams.
- Creating an emergency medical response system for a county.
- Creating 40 lab experiences for students in college laboratory training including: lists of equipment, supplies needed, and student worksheets, set-up information needed for the instructors for each lab.
- Creating a minimum of a 35 page single space paper, with at least 35 peer reviewed journals for the references on a topic related to lab medicine (research paper).
- Validation of an analyzer, test procedure etc with all supporting data, graphs and written description of the process.
- Two weeks working in a research lab with a 35 page paper describing the research and information learned.
- Twenty training modules for students in a lab experience completing performance competency testing at a clinical site.

**Grading:** (An example of the CLS grading format can be viewed at the end this handbook)  
 The different types of projects will lead to different types of grading criteria. If your advisor does not feel that the independent project submission merits at least a grade of C, the advisor will submit the project to the CLS Graduate Faculty Committee for review and recommendations for the student. The advisor will then forward these recommendations to the student and graduation will be delayed until a suitable submission for an independent project has been determined. An example of the grading of an independent project research paper is included at the end of the handbook. Generally, the grading will be in the following categories:

- A. The project is creative and is not just a compillation of another's work. It is well organized and presented in a professional manner and represents scholarly depth and work. Only minor change would improve the project.
- B. The project is missing one of the criteria listed for earning a grade of A and major changes would be needed to improve the project.
- C. The project is missing more than one of the criteria listed for earning a grade of A and major changes would be needed to be at a grade of A level.
- D. The project evaluated at a grade of C level and is not considered adequate and must be presented to the CLS graduate committee for consensus on a rewrite with probable delay of graduation.

**Human Subject Involvement:**

If the student will be involving any human subjects in the independent project, including surveys or laboratory material, it is advised that the student reads the information concerning human subjects located within the Graduate School handbook. If human subjects are involved, paperwork must be submitted and approved by the Institutional

Review Board at the University of North Dakota **BEFORE** the project proposal form can be forwarded to the Graduate School and before the project begins. The IRB approval process frequently takes at least four weeks, even with an expedited level form. More specific information can be found at: [www.und.edu/dept/orpd](http://www.und.edu/dept/orpd)

**Additional Information:**

- See the Graduate School Handbook  
[http://www.graduateschool.und.edu/docs/MastersHandbook2007\\_web.pdf](http://www.graduateschool.und.edu/docs/MastersHandbook2007_web.pdf)
- Topic Proposal Form and Instructions:  
<http://www.und.edu/dept/grad/html/forms.html>

## COMPREHENSIVE EXAM INFORMATION

### **Eligibility:**

A student must be advanced to candidacy before they are eligible to write their comprehensive exams. To be advanced to candidacy the student must have a program of study and topic proposal (for CLS 997 Independent Study) approved by the student's advisor and the dean of the graduate school. The advancement to candidacy must be accomplished at least one semester before the student wishes to graduate.

Comprehensive Exams are meant to illustrate your depth of understanding in Clinical Laboratory Science. The exams are not meant to be punitive, but rather a platform to exhibit the knowledge the student has acquired.

The student will need to answer eight questions on eight different areas of laboratory medicine. There are six core topics (Section A) and two questions that the student and advisor will select the topic from (Section B). All questions must be from courses listed on the student's program of study.

SECTION A: The six core topics are:

- CLS 501 Quality Assurance in the Clinical Laboratory and/or CLS 505 Financial Management of the Clinical Laboratory
- CLS 502 Erythrocytes in Health & Disease and/or CLS 503 Leukocytes in Health & Disease
- CLS 504 Medical Microbiology for Laboratory Professional
- CLS 506 Clinical Chemistry
- CLS 507 Clinical Immunohematology
- CLS 513 Advanced Clinical Immunology for Laboratory Professionals and/or CLS 518 Molecular Diagnostics

SECTION B: Two can then be chosen from the following topics:

- CLS 501 Quality Assurance in the Clinical Laboratory
- CLS 502 Erythrocytes in Health and Disease
- CLS 503 Leukocytes in Health and Disease
- CLS 505 Financial Management of the Clinical Laboratory
- CLS 509 Laboratory Education Methodologies
- CLS 513 Advanced Clinical Immunology for Laboratory Professionals
- CLS 517 Health Care Administration for the Clinical Laboratory Professional
- CLS 518 Molecular Diagnostics

Discuss your comprehensive exams with your advisor at least one semester before you wish to write the exams. At that time, you and your advisor will decide on the eight topics and you will be instructed to contact each course instructors to inquire “what to study”.

**Question Format:**

It is expected that each question will take approximately one and a half hours to complete. Only questions completed using a computer will be accepted (no hand written responses). Different instructors have different styles of questions. The student’s advisor will assist in contacting each instructor related to the question topic so the student can prepare adequately for each question. The instructor will narrow down the scope of the question so that the preparation for each topic can be limited to a reasonable level. The student will contact the instructor or other designated person to receive this information. The student will select a proctor and the questions will be mailed to the proctor in a packet with a cover letter giving specific instructions. It is

expected that the student completes the questions under the supervision of the proctor and will not have books, notes, programmable calculators, cell phones or electronic listening devices with them during the exams.

**Timing:**

To begin the process of receiving your comprehensive exam packet complete the form (Comprehensive Exam Request) found at the back of this handbook and mail or fax it as indicated on the form. Upon receipt, the CLS office will gather your questions and along with your cover letter the packet will be mailed to your proctor. If the student still has a course left to complete, all of the eight will be included in the packet and seven of the eight questions can be completed, with the last one following closer to the projected graduation date. It is expected that once the comprehensive exam writing begins, the student will write all of the questions (or at least seven of the eight) within a two week period. Often the student will write one question a day. Some students choose to write two in a day and then skip a day for review of the prepared responses. It is up to the student and the student's proctor to organize the scheduling. If the student chooses to write the exams within four weeks of the expected graduation date, any remediation that may be required may delay graduation.

**Remediation:**

If an instructor does not feel that the question was answered in a scholarly fashion, remediation of the question will occur. The instructor will advise the student concerning the shortcomings of the response and determine the level of the remediation. There are two levels of remediation.

- **Level I Remediation:**  
Level I remediation occurs if the student does not complete all portions of the question, but exhibits depth of understanding in the portions that were answered. At this level of remediation, the instructor will advise the student on what they are missing and request an open-book rewrite.
- **Level II Remediation:**  
Level II Remediation occurs if the student does not exhibit the depth of understanding consistently throughout their response. For a Level II Remediation, the faculty will have the option of assigning the same question or creating a new question for the student to prepare. A Level II Remediation will not be open-book, but be completed with a proctor and the same restrictions as the original question.

## CANDIDACY FOR THE DEGREE

**Time Frame:** No later than the semester before you plan to graduate.

There are a number of steps that must be fulfilled before a student can be advanced to candidacy. There is no separate form to complete to be advanced to candidacy but rather there are specific requirements that when met automatically advanced the student to candidacy.

Admission of a student to the Graduate School as a Degree Student in Approved Status implies only that the student has met the minimal entrance requirements and will be permitted to take graduate courses which normally will lead to a degree. The student has not been admitted as a candidate for a degree. Advancement to candidacy is a formal procedure and can be granted only after the student has met certain academic requirements. To become a candidate for Master of Science (non-thesis option), the following requirements must be met in approximately the following sequence:

1. Completion of the equivalent of one full-time semester (12 semester credits).
2. A GPA of at least 3.00 for all work attempted.
3. Appointment of Faculty Advisor:  
The advisor, who must be a member of the Graduate Faculty, will be appointed by the dean upon a written recommendation from the CLS graduate program director (Ruth Paur). The advisor is responsible to the program/department and to the Graduate School for the supervision of the student's work.
4. Program of Study:  
Students must submit a Program of Study for Graduate School approval which will have been developed in consultation with the advisor and signed by the CLS graduate program director. If a minor is declared, the program must also be signed by the chairperson of the minor department. The Program of Study should be developed early in the second semester and submitted to the Graduate School.
5. Topic Proposal of Independent Study:  
Student must obtain approval of a topic for the independent study. The advisor approves the Topic Proposal of Independent Study, and the student submits the form to the Graduate School to become part of the record. The topic proposal must be filed prior to the semester or session in which the student expects to graduate.
6. Final Examinations:  
Those advanced to candidacy for non-thesis master's degrees must pass written final comprehensive examinations which must cover the major field but may, at the advisor's discretion, draw upon or cover the supporting areas. Such examinations generally will be given and evaluated by the major department, but the results will be certified to the Graduate School by the advisor and the CLS graduate program director on the form Final Report on Candidate by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) will be arranged by the advisor and administered by the department no earlier than the semester proceeding the semester in which the candidate intends to graduate. Candidates may not take the final comprehensive examination(s) unless they have been advanced to candidacy for the degree, and are in satisfactory academic

standing. Students and their advisors will be notified in writing of the advancement to candidacy. The student must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.

## **FINAL REPORT ON CANDIDATE**

The final report must be submitted to the Graduate School by the published deadline in which the student plans to graduate. **THE CLS PROGRAM WILL PROCESS THIS FINAL FORM REPORT ON THE STUDENT BY THE PUBLISHED DEADLINE.** A delay in submitting comprehensive exams and/or the independent project to within four weeks of the date this form is due could delay the student's graduation until the following semester.

By completing this final report the CLS graduate program director and your advisor are reporting to the Graduate School the results of your comprehensive examinations and confirming that your Independent Study Report has been completed by you the student and accepted by your advisor. After receiving this report the Graduate School will authorize your degree if all conditions have been met as required.

## **GRADUATE SCHOOL PETITIONS**

In the case of a missed deadline, registration error, incomplete grade, etc., a student has the right to petition the Dean of the Graduate School in order to correct the problem. Graduate School petition forms are available at the above website. The student must state clearly what is being petitioned. If the petition involves a specific course, the course number must be listed. Each petition form lists the signature required for each action.

Following is a brief list of potential reasons to file a petition:

- Adding a course after the deadline
- Enrolling in more credits than allowed
- File for graduation after the deadline
- Enrolling in 996 Continuing Enrollment beyond the number of semesters allowed
- Repeating a course with a grade of C or better

Additional information on each of these requirements to file a petition can be found in the graduate school handbook located online at

[http://www.graduateschool.und.edu/docs/MastersHandbook2007\\_web.pdf](http://www.graduateschool.und.edu/docs/MastersHandbook2007_web.pdf)

## **CLINICAL LABORATORY SCIENCE MANAGEMENT CERTIFICATE**

### **Specific Information:**

The Clinical Laboratory Science Management Certificate program provides advanced skills to practicing laboratory professionals in health administration, leadership, management, quality assurance and health informatics. The program is offered by distance learning. The method of course delivery is web-based. Students are required to have access to the internet. Specific computer requirements are available in an earlier section of this handbook.

### **Admission Requirements:**

1. BA or BS degree in a science discipline
2. Minimum 2.5 GPA in undergraduate coursework
3. Work experience and/or desire to work in the CLS field

### **Course Requirements (Curriculum):**

CLS 501	Quality Assurance in the Clinical Laboratory .....	2cr.
CLS 505	Financial Management of the Clinical Laboratory .....	2cr.
CLS 508	Leadership and Conflict Resolution in the Health Science.....	2cr.
CLS 514	Computer Applications in Clinical Laboratory Science.....	2cr.
CLS 517	Health Care Administration for the Laboratory Professional .....	<u>2 cr.</u>
<b>Total</b>		<b>10 cr.</b>

### **Course Descriptions:**

See course descriptions earlier in this handbook or view online at [www.medicine.nodak.edu/cls](http://www.medicine.nodak.edu/cls).

### **Advisor:**

Ruth Paur (Program Director) will be assigned as the advisor for students admitted into the CLS Management Certificate program.

### **Course Offerings:**

The CLS management certificate courses have an 18 month rotation cycle. The rotation schedule of courses can be viewed at the CLS website where it is updated annually.

### **Program of Study:**

The student must complete the program of study form for the CLS Management Certificate the semester prior to the semester of completion. The form is available on the web site of the Graduate School at

<http://www.und.edu/dept/grad/html/certificateforms.htm>

### **Application for Certificate:**

The student must complete the application for the certificate. This can be found at the graduate school website and should be completed only after the program of study has

been approved by the graduate school and the student is close to completing their program of study.

<http://www.und.edu/dept/grad/html/certificateforms.htm>

## **GRADUATE SCHOOL POLICY CONCERNING EARNING BOTH THE CLS MANAGEMENT CERTIFICATE AND THE MS IN CLS DEGREE**

Graduate School policy states that credits earned completing a certificate cannot be used to also complete the total credits required in a degree program. If both the management certificate and the MS in CLS degree are desired by the student, the credits earned in the certificate program cannot be applied to the credits in the masters program. CLS 501 and CLS 505, which are core requirements in the CLS MS program, would be included as content knowledge, but to earn the 32 graduate credits required for a the CLS in MS degree, four additional credits must be taken to complete the requirements. The four additional credits would be specific Directed Studies courses. The student should discuss this dual plan with their advisor to ensure that the Graduate School's policies are met early in their program.

# GRADUATE SCHOOL FORMS

**Always use the current forms available for download**

**Located at the Graduate School Website:**

[www.graduateschool.und.edu](http://www.graduateschool.und.edu)

## FREQUENTLY ASKED QUESTIONS (FAQ)

1. I need signatures of my advisor, graduate program director, etc., on a required form. How can I obtain them since I am not on campus at this time.  
*If you would fax the form to the CLS office (701-777-2404) the CLS administrative assistant will gather the required signatures for you and forward the form on to its' destination.*
2. Do I need to be continually enrolled? What if I want to take a semester off?  
*No, you don't need to be continually enrolled but you must complete a form in order to not take courses for a semester (other than summer). See the section Leave of Absence and Readmission on page 20 of this handbook for more information.*
3. What do I enroll in if I have finished all my courses and the only thing left I have to do is officially graduate?  
*See page 14, under Helpful Hint#4 of this handbook for more information.*
4. Will my credits for CLS 997 remain an incomplete until I am finished?  
*Yes, they will remain until your final copy is finished and a grade of SP is assigned by your advisor.*
5. How do I change my program of study?  
*After consulting with your advisor, fill out the form "Changes to a Program of Study" which can be found online at the graduate school website under forms. After your advisor signs the form, submit it to the graduate school for the Dean's approval. Do not submit a new program of study unless there are major changes.*
6. What happens if I can not complete a course on time?  
*If you can't complete a course on time because of something beyond your control, you may request to receive an incomplete grade. Contact your instructor ASAP. Also see additional information on page 20 of this handbook (Incomplete Policy).*
7. What happens if my GPA falls below a 3.0?  
*Your record will be reviewed at the graduate school level. Students having completed 12 credits or more will be placed on academic probation for one semester; students having accumulated fewer than 12 credit hours will be placed on academic probation until either 9a) the GPA is raised to at least 3.0 or (b) whichever occurs first. If, at the end of the probationary period, the GPA is still less than 3.0, the student will be dismissed.*
8. How do I drop a course after the deadline?  
*You must complete an Administrative Procedures petition. This form can be found on the Graduate School or Office of the Registrar's website under forms for students. This form, with signatures and recommendations for approval or disapproval, must be received in the graduate school office for the graduate dean's signatures. Explain clearly why you are requesting to drop*

*after the deadline. The UND administrative procedures committee will meet on these petitions throughout the semester, and you will be notified by letter of their decision. (You may complete the form and fax it to the CLS program at 701-777-2634 and the CLS office will gather the necessary signatures and forward it to the graduate school for the Dean's signature.)*

9. How to do I apply to graduate?

*You need to be advanced to candidacy the semester **before** you graduate. See additional information on page 27 of this handbook. You will receive an "application to graduate" form from the graduate school after you have been advanced to candidacy.*

10. Is there a time limit on finishing my degree?

*Yes, graduate courses more than seven years old are considered obsolete and may not be counted to fulfill course requirement for an advanced degree program. Program of study more than seven years old are obsolete. Obsolete UND graduate courses may be revalidated and may be counted toward an advanced degree on the recommendation of the student's faculty advisor and the dean of the graduate school. There is a form to complete to begin the revalidation process and the form is located at the graduate school website.*

11. I do not remember who was assigned as my advisor. How do I find out who it is?

*You would have received a "Student Status Sheet" from the graduate school when you were admitted which included your advisor information. You can also view your advisor information on UND Campus Connection using your student ID#.*

<http://www.und.edu/dept/registrar/campusconnection/index.htm>

12. I realize that two credits are required to fulfill my CLS 591 Directed Studies requirement. I am confused on how to fulfill this requirement.

*Many students have questions on this requirement. We have tried to explain it further and more in depth on page 21 of this handbook. If you still have a question, contact your advisor or the CLS program's administrative assistant.*

13. Am I able to receive both the MS in CLS degree and the CLS Management Certificate? See page 30 for an overview of the graduate school policy.

14. Where do I view my official semester grades?

*Your final official semester grades should always be viewed on the UND campus connection system. The grade entered on Campus Connection will be the official grade placed on your official UND transcript. Blackboard is the program we use to teach and administer our courses online but is not the official site to view your final semester grades.*

15. Are housing accommodations provided when I attend a laboratory, seminar or capstone course on campus?

*No. Housing accommodations are the responsibility of the student. We are able to extend to you the State of ND rate of \$55.00/night or \$70/night for two people sharing the room. Additional information will be made available to you in a separate email when you are registered in the course and closer to the time the course is scheduled.*

If you think of any other FAQ that would be beneficial to post in this section please email them to the CLS administrative assistant, Mary Beth McGurran at [mcgurran@medicine.nodak.edu](mailto:mcgurran@medicine.nodak.edu). We would be most happy to include them.

## CLS 997 INDEPENDENT PROJECT SCHOLARLY/RESEARCH PAPER DIRECTIONS

Directions: Have the topic and topic areas approved by your advisor and the graduate school. Research the topic; the number of journals found depends on the project. See Independent Study Information in the Graduate Handbook. This project must be word processed: single spaced (save a tree). Check with your advisor as to their writing style preferred for citing references and how references should appear in text (example: using superscripts). Provide copies of journal articles if not obtainable from PubMed UND Medical Library. Length of paper: Depends on project: Consult advisor and view Independent Study Information in the Graduate Handbook.

### CLS 997 – INDEPENDENT PROJECT EVALUATION

Name \_\_\_\_\_ Date \_\_\_\_\_  
Topic \_\_\_\_\_

#### **WRITTEN PAPER (worth 100 points):**

##### **Part A. Format of the Paper (a-c): Total = 25 points** \_\_\_\_\_

- a. Organization of paper, e.g., title, subtitles, intro, plan of development, summary, etc.  
 \_\_\_\_\_ Suggest you use subtitles  
 \_\_\_\_\_ Add an introduction, and/or \_\_\_\_\_ Add a summary  
 \_\_\_\_\_ Work on organization, plan of development
- b. Grammar (third person, no spelling errors, good sentence structure, simplicity)  
 \_\_\_\_\_ Use third person for professional papers  
 \_\_\_\_\_ Work on spelling, use spell check, plus have a good speller read it - peer, or writing center or \_\_\_\_\_  
 \_\_\_\_\_ Work on grammar, sentence structure, read paper aloud, have a peer read it, or writing center  
 \_\_\_\_\_ Work on simplicity, uncomplicated sentences, read paper aloud, have a peer read it, or writing center
- c. Clarity-clear and concise, easy to read  
 \_\_\_\_\_ Work on flow of paper, ease of reading, read paper aloud, have a peer read it, or writing center  
 \_\_\_\_\_ Work on clarity and conciseness, read paper aloud, have a peer read it, or writing center  
 \_\_\_\_\_ Other comments

##### **Part B: Content: 50 points** \_\_\_\_\_

- a. Content (informative, useful valid information, not outdated, adequately covered)  
 \_\_\_\_\_ Work on valid information, not from lay journals or .com info  
 \_\_\_\_\_ Work on depth of material covered or understanding of material  
 \_\_\_\_\_ Work on getting more updated information, current journals  
 \_\_\_\_\_ Work on relating it to clinical laboratory work; \_\_\_\_\_ Table format for a summary of usable information for a clinical laboratory.  
 \_\_\_\_\_ Other comments

##### **Part C: Bibliography: 25 points** \_\_\_\_\_

- a. Bibliography (valid, recent references, written correctly in bibliography and cited correctly in text, 10 or more references)  
 \_\_\_\_\_ Work on valid references, ones from a medical journal or text source and not outdated  
 \_\_\_\_\_ Copies of references not provided or only in abstract form, or not available online or in library  
 \_\_\_\_\_ References not written in AMA, Vancouver form  
 \_\_\_\_\_ References not cited by superscripts in text, see example paper in library and directions  
 \_\_\_\_\_ No references  
 \_\_\_\_\_ Other comments

**TOTAL POINTS** \_\_\_\_\_

The following scale is used in grading the scientific paper:

##### **Part A and C, Part B 2X this rating**

- 25 =Excellent  
 22.5 =Very Good  
 20 =Acceptable  
 18 =Could use improvement  
 \*12 =Very poor-definitely needs to be redone

##### **Total Points/Grade**

A	90-100
B	80-89
C	70-79
D	60-69
F	<69



**Graduate  
Master of Science  
CLS Transcript Review Worksheet**

Date of review: \_\_\_\_\_

Name:  
Student ID#  
E-Mail:  
Phone #:  
Address:

This worksheet is prepared only as a tool to aid in your understanding of the University's requirements for the Master's Degree in Clinical Laboratory Science.

Check boxes if completed:

<input type="checkbox"/> <b>Required Courses</b>	<b>Semester Planned</b>
<input type="checkbox"/> CLS 501 Quality Assurance in the Clinical Laboratory.....	_____
<input type="checkbox"/> CLS 502 Erythrocytes in Health and Disease.....	_____
<input type="checkbox"/> CLS 503 Leukocytes in Health and Disease.....	_____
<input type="checkbox"/> CLS 504 Medical Microbiology.....	_____
<input type="checkbox"/> CLS 505 Financial Management of the Clinical Lab.....	_____
<input type="checkbox"/> CLS 506 Clinical Chemistry.....	_____
<input type="checkbox"/> CLS 507 Immunohematology.....	_____
<input type="checkbox"/> CLS 513 Advanced Clinical Immunology.....	_____
<input type="checkbox"/> CLS 515* Capstone.....	_____
<input type="checkbox"/> CLS 518 Molecular Diagnosis.....	_____
<input type="checkbox"/> CLS 521* Seminar.....	_____
<input type="checkbox"/> CLS 591 Directed Studies (1of2) .....	_____
<input type="checkbox"/> CLS 591 Directed Studies (2of2).....	_____
<input type="checkbox"/> CLS 997 Independent Study.....	_____
<input type="checkbox"/> <b>Three of Five Laboratory Courses*</b>	
<input type="checkbox"/> CLS 510* Erythrocytes Laboratory.....	_____
<input type="checkbox"/> CLS 511* Leukocytes Laboratory.....	_____
<input type="checkbox"/> CLS 512* Immunohematology Laboratory.....	_____
<input type="checkbox"/> CLS 519* Molecular Diagnostics Laboratory.....	_____
<input type="checkbox"/> CLS 520* Medical Microbiology Laboratory.....	_____
<input type="checkbox"/> <b>Elective Available</b>	
<input type="checkbox"/> CLS 508 Leadership & Conflict.....	_____
<input type="checkbox"/> CLS 514 Computer Applications.....	_____
<input type="checkbox"/> CLS 517 Health Care Administration for the Clinical Laboratory.....	_____
<input type="checkbox"/> CLS 509 Education Methodologies in Laboratory Science.....	_____
<b>TOTAL CREDITS</b> .....	_____

\*One week course on campus, not available by Distance Learning

- Program of Study submitted**
- Independent Project Proposal Submitted**

**Title:**  
**Project Completion Date:**

**Estimated Graduation Date:**

**Comments:**

THIS FORM WOULD BE GOOD TO BRING WITH YOU FOR AN ADVISEMENT SESSION IF YOU HAVE ONE SCHEDULED FOR WHEN YOU ARE ON CAMPUS FOR A COURSE (LAB, CAPSTONE, SEMINAR).



Date of review: \_\_\_\_\_

## Graduate CLS Management Certificate Transcript Review Worksheet

Name:  
Student ID#:  
E-Mail:  
Phone #:  
Address:

This worksheet is prepared only as a tool to aid in your understanding of the University's requirements for Clinical Laboratory Science graduate certificate in management.

Check boxes if completed:

<input type="checkbox"/> <b>Course Requirements</b>	<b>Semester Planned</b>
<input type="checkbox"/> CLS 501 Quality Assurance in the Clinical Laboratory	_____
<input type="checkbox"/> CLS 505 Financial Management of the Clinical Lab	_____
<input type="checkbox"/> CLS 508 Leadership and Conflict Resolution in the Health Sciences	_____
<input type="checkbox"/> CLS 514 Computer Application in Clinical Laboratory Science	_____
<input type="checkbox"/> CLS 517 Health Care Administration for the Clinical Lab Professional	_____

Program of study completed:

Estimated completion date:

Reminder: Student must apply for their certificate utilizing the form found at the graduate school website. This cannot be done until their program of study is completed.

Comments:

## COMPREHENSIVE EXAM REQUEST

This is a CLS form. By submitting it you are requesting that your comprehensive exam packet be mailed to your proctor. Please fax this form (701-777-2404) or mail it to the CLS office and allow 3 days for processing and mailing to occur from the CLS office to your proctor.

---

Student: \_\_\_\_\_ ID# \_\_\_\_\_

Student's Advisor: \_\_\_\_\_

Advanced to Candidacy:  Yes  No

Anticipated graduation year: \_\_\_\_\_

Anticipated graduation semester:  Fall (Dec)  Spring (May)  Summer (Aug)

By checking below I am agreeing that I have read and understand that the completed comprehensive exam packet must be received in the CLS office by the following date for the graduation semester listed below:

Yes Fall: Due November 15

Yes Spring: Due April 1

Yes Summer: Due June 15

I would like to begin writing my comprehensive exams on: \_\_\_\_\_  
Date

---

Proctor: \_\_\_\_\_

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

Title: \_\_\_\_\_

Address: \_\_\_\_\_  
(include name of business establishment such as hospital, clinic, library, etc)

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

Telephone: \_\_\_\_\_ Fax#: \_\_\_\_\_

The eight topics to be included in my comprehensive exams are:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

## EXAMPLE OF STUDENT'S FINAL EXAM LETTER TO PROCTOR

### CLS LETTERHEAD STATIONARY

Date

Proctor Name and Address

Dear \_\_\_\_\_:

Thank you for agreeing to serve as the proctor to administer Student's Name comprehensive exam. The exam questions for you to administer are enclosed. \_\_\_\_\_ will be in contact with you concerning the specific dates he/she would like to complete the exam questions.

The exams include:

Course

Leukocytes in Health and Disease  
Erythrocytes in Health and Disease  
Immunohematology  
Immunology  
Microbiology  
Quality Assurance  
Clinical Chemistry  
Molecular Diagnostics

Instructor

Mary Coleman  
Mary Coleman  
Ruth Paur  
Ruth Paur  
Ruth Paur  
Janna Schill  
Mary Coleman (Facilitator)  
Linda Ray

- Please provide an exam environment that is quiet, comfortable, and computer accessible. A computer is required to complete each exam question and we ask that the answer be printed out and stapled to the corresponding exam question.
- Stapled to each question is a proctor form. As the proctor, please complete each form at the time the student begins and ends an exam question. The student should receive the question from you and return it to you directly upon completion.
- Each exam question should be completed in a 1½ -2 hour time period.
- An exam cannot be taken home.
- Textbooks or other materials cannot be used to assist in answering the question.
- When the exams have been completed please mail them back all together using the enclosed self addressed envelope. The student will need to supply postage so that you can personally mail the exam packet back to us for grading or if you elect to have the student mail the exam packet please sign your name across the sealed flap of the envelope.
- The complete packet of questions should be completed within two weeks of writing the first exam question and at the very latest need to be received in our office by \_\_\_\_\_.

Again, thank you for your assistance. If you have any questions or concerns, please contact the CLS administrative assistant, Mary Beth McGurran at [mcgurran@medicine.nodak.edu](mailto:mcgurran@medicine.nodak.edu) or 701-777-2634.

Sincerely,

Student's Advisor Name and Title

mbm  
Enc.

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