



**University of Nebraska Medical Center  
School of Allied Health Professions  
Clinical Laboratory Science Program  
Nebraska Methodist Hospital Medical Technology Program**

- Course Title:** Clinical Laboratory Science Theory, Application and Correlation
- Course Number:** CLS 412
- Credit Hours:** 5 semester hours
- Prerequisites:** Enrollment in the Clinical Laboratory Science Program and satisfactory completion of: CLS 414 Clinical Chemistry I  
CLS 416 Clinical Hematology I  
CLS 418 Clinical Microbiology I  
CLS 422 Clinical Immunohematology I  
CLS 413 Clinical Endocrinology and Toxicology  
CLS 419 (Parasitology Student Laboratory)  
CLS 426 (Urinalysis Student Laboratory)  
CLS 420 (Immunology Student Laboratory and Lecture Series)

**Semesters Offered:** Semester II

**Course Coordinator:** Sandra Latshaw, MA, MT(ASCP)SM 402-423-9193 sjlatsha@unmc.edu

**Course Curriculum:** Karen Honeycutt, MEd, MLS(ASCP)<sup>CM</sup>SM<sup>CM</sup>

**Planning Committee:** Karen Keller, MLS(ASCP)<sup>CM</sup>SH<sup>CM</sup>  
Ricki Otten, MT(ASCP)SC  
Julie Richards, MPA, MT(ASCP)BB

**Class Days, Times, Location:** Tuesday and Thursday afternoons from 1:00-3:00 p.m. central time. See the units/sessions for specific days and topics. Omaha students should refer to the Course Schedule for location of cases; lectures will be held in Room 2018 of the Sorrell Education Center.

**Course Description:** This course includes the application, evaluation and correlation of laboratory procedures used in the diagnosis and treatment of common disease states. Opportunities for building critical thinking, problem solving, leadership, oral communication, professionalism, and team work skills are provided in small group clinical case discussions and presentations.

**Instruction:** Instructional methods will include lecture, large and small group case discussion, independent reading assignments, self-assessments, worksheets and online instruction including PowerPoint programs and archived presentation sessions.

**Course Goals:**

Upon successful completion of Clinical Laboratory Science Theory, Application and Correlation, the Clinical Laboratory Science student will:

1. Correlate, integrate and supplement information from all clinical laboratory courses including clinical rotation experiences, student laboratory lectures and labs, independent study exercises, self-assessment exams, and all related objectives previously covered in the program.
2. Develop communication, teamwork, interpersonal, critical thinking and problem-solving skills while correlating clinical laboratory test results to normal and abnormal human physiology.
3. Correlate laboratory results in the study of body systems; disease states; hematologic, endocrinologic, and immunologic disorders; blood bank and transfusion problems; and infectious diseases.

**Required Textbooks:**

1. Bishop ML, Fody EP, Schoeff L. (2010). *Clinical Chemistry: Techniques, Principles, Correlations* (6<sup>th</sup> ed.). Baltimore, MD: Lippincott Williams & Wilkins. ISBN: 978-0-7817-9045-1
2. Mahon CR, Lehman DC, Manuselis G. (2011). *Textbook of Diagnostic Microbiology* (4<sup>th</sup> ed.). Maryland Heights, MO: Saunders Elsevier. ISBN: 978-1-4160-6165-6
3. McKenzie SB, Williams JL. (2010). *Clinical Laboratory Hematology* (2<sup>nd</sup> ed.). Upper Saddle River, NJ: Pearson Education, Inc. ISBN: 978-0-1351-3732-1
4. Harmening DM. (2005). *Modern Blood Banking and Transfusion Practices* (5<sup>th</sup> ed.). Philadelphia, PA: F.A. Davis Company. ISBN: 978-0-8036-1248-8
5. Stevens CD. (2010). *Clinical Immunology and Serology: A Laboratory Perspective* (3<sup>rd</sup> ed.). Philadelphia, PA: F.A. Davis. ISBN: 978-0-8036-1814-5
6. Brunzel NA. (2004). *Fundamentals of Urine & Body Fluid Analysis* (2<sup>nd</sup> ed.). Philadelphia, PA: Saunders. ISBN: 978-0-7216-0178-6

**Grading System:**

The course grade will be based on seven written unit examinations and 21 case pre-session quizzes. Quizzes are to be completed on Blackboard by 8:00 a.m. central time on each case discussion day. Exams will be taken individually at the scheduled time followed by a small group exam, except for degree advancement option students (DAO). The exam is available online to DAO students, who will not take a group exam. DAO students will have one week from the stated exam date to schedule the exam with their proctor. According to program policy, any time a student is absent for a scheduled exam, the missed exam must be taken the day upon return of the absence.

Exam scores will be calculated as 90% individual score and 10% group score (when taken). The final grade will then be determined as 90% the calculated exam scores and 10% the quiz scores. Grades will not be scaled.

<b>Grading Scale:</b>	A+ = 97.00-100.00	B- = 80.00-82.99
	A = 93.00-96.99	C+ = 77.00-79.99
	A- = 90.00-92.99	C = 73.00-76.99
	B+ = 87.00-89.99	C- = 70.00-72.99
	B = 83.00-86.99	Failing = Below 70

### Grade

- Requirements:**
1. Satisfactory completion of the course requires an overall average of  $\geq 70\%$  on all written examinations:
    - a.  $< 70\%$  earned on any single calculated exam will require successful completion ( $\geq 85\%$ ) of remedial work.
    - b. All remedial work must be completed to the satisfaction of the course faculty. Repeated submissions of unsatisfactory remedial work will lead to a discussion with UNMC faculty and may trigger an Unprofessional Behaviors Documentation.
    - c. Successful completion of remedial work will not alter the original earned exam score.
    - d. A calculated exam average of  $< 70\%$  upon completion of Exam #4 and any exam after that requires additional enhancement work (see course guidelines).
    - e. If either the final calculated exam average or the final course grade is  $< 70\%$ , successful completion ( $\geq 70\%$ ) of a comprehensive final exam will be required.\*
  2. For students not showing satisfactory progress in the course, additional assignments may be made at the discretion of the course faculty and administration.
  3. Documentation of unprofessional behavior will trigger the completion of a Professional Behaviors Evaluation and a counseling session with program administration. If a student does not improve their professional behavioral skills after counseling, the student may be placed on non-academic probation.
- \*Once the comprehensive final exam has been successfully completed, the student will obtain an altered average of 70%. If a  $\geq 70\%$  is not achieved on this exam, the student will receive a failing grade for the course. The student either will be dismissed from the program or will be required to repeat CLS 412 the next time the course is offered (spring semester of the following year).

### ADA Accommodations:

It is the policy of the University of Nebraska Medical Center to provide flexible and individualized accommodation to students with documented disabilities. To receive reasonable accommodations, students must complete a Request for Services application and provide documentation to the Services for Students with Disabilities office. Information is available at the Counseling and Student Development Center website at [www.unmc.edu/stucouns/](http://www.unmc.edu/stucouns/) You may contact Ronda Stevens, MSW, Coordinator of Services for Students with Disabilities at 402-559-5553 or [rstevens@unmc.edu](mailto:rstevens@unmc.edu). The office is located in Bennett Hall, 6001 within the Counseling and Student Development Center. Meetings are by appointment. Adequate time for processing, up to four weeks, is recommended.

## **Units/Sessions:**

### Unit 1

Session 1	1/3/2012	Hemostasis and Thrombosis Lecture
Session 2	1/5	Meningitis Cases
Session 3	1/10	Immunology Cases
Session 4	1/12	Coronary Artery Disease Cases
Unit 1 Exam	1/17	

### Unit 2

Session 5	1/19	Thyroid and Parathyroid Disorder Cases
Session 6	1/24	Renal Disorder Cases
Session 7	1/26	Anemia/Autoimmune Disorder Cases
Unit 2 Exam		

### Unit 3

Session 8	1/31	Antimicrobial Susceptibility Testing Lecture
Session 9	2/2	Respiratory Disorder Cases I
Session 10	2/7	Carbohydrate Disorder Cases
Session 11	2/9	Transfusion Incompatibility Cases
Unit 3 Exam	2/13	

### Unit 4

Session 12	2/14	HIV Infections Lecture Cases
Session 13	2/16	Therapeutic Drug Monitoring and Toxicology Cases
Session 14	2/21	Gastrointestinal Disorder Cases
Session 15	2/23	Coagulation Disorder Cases
Unit 4 Exam	2/27	

### Unit 5

Session 16	2/28	Mycobacteria Lecture
Session 17	3/1	Reproductive Disorder Cases
Session 18	3/6	Liver Disorder Cases
Session 19	3/8	Transfusion Reaction Cases
Unit 5 Exam	3/12	

### Unit 6

Session 20	3/13	Sexually Transmitted Disease Cases
Session 21	3/15	Malignant WBC Disorder Cases
Session 22	3/27	Adrenal Disorder Cases
Unit 6 Exam	4/2	

### Unit 7

Session 23	3/29	Immune Hemolytic Anemia Cases
Session 24	4/3	Biopreparedness Lecture
Session 25	4/3	Newborn Screening Lecture
Session 25	4/5	Body Fluid Cases
Session 26	4/10	Respiratory Disorder Cases II
Unit 7 Exam	4/16	

## Statement of Academic Integrity:

The University of Nebraska Medical Center has established a policy on academic integrity and professional conduct. This policy may be found in the UNMC Student Handbook. All students are expected to adhere scrupulously to this policy. Cheating, academic misconduct, fabrication, and plagiarism are viewed as serious matters and will lead to disciplinary action as described in the UNMC Student Handbook under Procedural rules Relating to Student Discipline. Additional materials related to Responsible Conduct in Research can be found in the UNMC Student Handbook. Selected sections from the UNMC Student Handbook follow:

**CHEATING:** A general definition of cheating is the use or attempted use of unauthorized materials or information for an academic exercise. Examples of cheating include but are not limited to:

1. using unauthorized materials such as books, notes, calculators or other aids during an examination or other academic exercises;
2. receiving unauthorized assistance from another person during an exam or exercise such as copying answers, receiving answer signals, conversation or having another person take an examination for you;
3. providing assistance to another person during an exam or exercise, such as allowing your answers to be copied, signaling answers or taking an exam for someone else;
4. obtaining answers and/or other information without authorization from someone who has previously taken an examination;
5. including all or a portion of previous work for another assignment without authorization;
6. appropriating another person's ideas, processes, result, or words without giving appropriate credit, i.e. an appropriate attribution or citation (plagiarism). For example, a student who quotes verbatim the results of a previous student's work in a required term paper, but fails to credit the individual through citation. The work is recent and thus cannot be considered common knowledge.

**ACADEMIC MISCONDUCT:** Academic misconduct is defined as the falsification of official documents and/or obtaining records, examinations or documents without authorization. Several examples of academic misconduct are:

1. the unauthorized acquisition of all or part of an unadministered test;
2. selling or otherwise distributing all or part of an unadministered test;
3. changing an answer or grade on an examination without authorization;
4. falsification of information on an official university document such as a grade report, transcript, an instructor's grade book or evaluation file or being an accessory to an act of such falsification;
5. forging the signature of an authorizing official on documents such as letters of permission, petitions, drop/add, transcripts, and/or other official documents;
6. unauthorized entry into a building, office, file or computer data base to view, alter or acquire documents.

**Research misconduct** has been defined by the Federal DHHS Office of Research Integrity (ORI) and UNMC subscribes to this definition: **"Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results."** **Research misconduct does not include honest error or differences of opinion. It is important that every student understand the meaning of fabrication, falsification, and plagiarism.**

**Fabrication** is making up data or results and recording or reporting them. Some examples are:

1. indicating a laboratory experiment had been repeated numerous times or
2. done in a controlled environment when it had not, thus leading to an invented or uncorroborated conclusion.

**Falsification** is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research or academic performance is not accurately represented in the research or academic records.

Some examples are:

1. altering an original source document, misquoting or misrepresenting a source to support a point of view or hypothesis;
2. Using computer software to change research images so they show something different than the original data.

**Plagiarism** is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit, i.e. an appropriate attribution or citation. An example is:

1. In the methods section of a thesis, a graduate student describes a procedure used in research for the thesis. The procedure was developed by a fellow graduate student in the laboratory of their major professor; however, neither the student who developed this procedure nor the major professor was given credit in the thesis. This implies that the author had himself developed the procedure.
2. In the background section of a thesis, a graduate student quotes verbatim the results of a previous investigator's work but fails to credit the individual through citation. The work is recent and thus cannot be considered common knowledge.