



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

**Course Title:** Clinical Microbiology II

**Course Number:** CLS 419

**Credit Hours:** 4 semester hours

**Prerequisites:** Enrollment in the Clinical Laboratory Science Program and satisfactory completion of CLS 418 Clinical Microbiology I.

**Semesters offered:** Semester II

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

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**Class Days, Times, Location:** Established for each student at multiple clinical locations.

**Course Description:** This course builds on the theory, practical application, technical performance and evaluation of the procedures for isolation, identification and susceptibility testing of infectious disease organisms in humans introduced in CLS 418 Clinical Microbiology I. This course includes bacteriology, mycology, parasitology, virology and serology, and emphasizes the correlation of clinical laboratory data with the patient's diagnosis and treatment.

**Instruction:** Instructional methods will include independent reading assignments, lectures, small group discussions, case studies, worksheets, exercises, slides (pictures and microscopic), archived presentation sessions, online synchronous and/or asynchronous delivery and clinical experience.

**Course Goals:** Upon successful completion of Clinical Microbiology II, the Clinical Laboratory Science student will:

1. Demonstrate a working knowledge of standard laboratory procedures performed in bacteriology, parasitology, mycology, virology and serology.
2. Perform laboratory procedures with accuracy and efficiency to provide quality patient care.

3. Assess the laboratory's role in the diagnosis and treatment of disease states.
4. Assess the role of quality control in the clinical microbiology laboratory.
5. Demonstrate proper procedure and technique when handling clinical specimens.
6. Demonstrate the ability to effectively communicate with the healthcare team, peers, patients and the public.
7. Effectively utilize clinical information systems to process patient data.

**Required Textbook:** 1. Mahon CR, Lehman DC, Manuselis G. (2010). *Textbook of Diagnostic Microbiology* (4<sup>th</sup> ed.). Maryland Heights, MO: Saunders Elsevier. ISBN: 978-1-4160-6165-6

- Major References:**
1. MTS Laboratory Training Library, University of Washington Department of Laboratory Medicine. *Gram Stain; Parasitology; and Mycology* modules. Available at <http://www.medtraining.org/ltl>.
  2. Center for Disease Control. *DPDx: Identification and Diagnosis of Parasites of Public Health Concern*, Available at: <http://www.dpd.cdc.gov/dpdx>.
  3. Stevens CD. (2010). *Clinical Immunology and Serology: A Laboratory Perspective* (3<sup>rd</sup> ed.). Philadelphia, PA: F.A. Davis Company.
  4. Department procedure manuals

**Additional Reference:** Winn W, Allen, SD, Janda WM, Koneman EW, Schreckenberger D, Procap GW, Woods, GL. (2006). *Koneman's Color Atlas and Textbook of Diagnostic Microbiology* (6<sup>th</sup> ed.). Baltimore, MD: Lippincott Williams & Wilkins.

**Grading System:** 60% of the final course grade is based on theoretical aspects, assessed by written exams and quizzes.  
40% of the final course grade is based on technical laboratory performance, assessed by laboratory practicals and technical evaluations.

Evaluation of professional behaviors shall be structured so that the faculty and the student can assess behavioral and professional traits. Results of this evaluation are used in counseling for professional development.

<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:**

Satisfactory completion of the course requires each of the following:

1. An overall average of  $\geq 70\%$  on all bacteriology written examinations. An overall written exam average of  $< 70\%$  requires successful completion ( $\geq 70\%$ ) of a comprehensive final exam.\*
  - a.  $< 70\%$  earned on any single exam will require successful completion ( $\geq 85\%$ ) of remedial work.
  - b. All remedial work must be completed to the satisfaction of the faculty/site coordinator or instructor. Repeated submissions of unsatisfactory remedial work will lead to a discussion with UNMC/NMH faculty and may be documented on the Professional Behaviors Evaluation.
  - c. Successful completion of remedial work will not alter the original earned exam score.
2. A  $\geq 70\%$  on the clinical parasitology written examination.
  - a.  $< 70\%$  on this exam will require successful completion ( $\geq 85\%$ ) of remedial work.
  - b. Upon successful completion of the remedial work an additional exam will be required which must be passed with a  $\geq 70\%$ .\*<sup>#</sup>
3. A  $\geq 70\%$  on the mycology written examination.
  - a.  $< 70\%$  on this exam will require successful completion ( $\geq 85\%$ ) of remedial work.
  - b. Upon successful completion of the remedial work an additional exam will be required which must be passed with a  $\geq 70\%$ .\*<sup>#</sup>
4. A  $\geq 70\%$  on the serology written examination.
  - a.  $< 70\%$  on this exam will require successful completion ( $\geq 85\%$ ) of remedial work.
  - b. Upon successful completion of the remedial work an additional exam will be required which must be passed with a  $\geq 70\%$ .\*<sup>#</sup>
5. A  $\geq 70\%$  on all practical examinations. If a score is  $< 70\%$ , make-up work will be required.\*
6. Achieving no less than the minimum performance level for each skill listed on the Technical Evaluation.
7. Successful completion of all components as stated on the Professional Behaviors Evaluation. If a student does not successfully meet all components, they may be placed on non-academic probation.
8. For students who are not showing satisfactory progress in the course, additional assignments may be made at the discretion of the course faculty and administration. For example,  $< 70\%$  earned on both CLS 418 and CLS 419 exams covering the same major content area.

\*Once the required work has been successfully completed, the student will obtain an altered score or average of 70%. If the required work is not successfully completed, the student may be put on academic probation and be required to demonstrate progress to remain in the course.

<sup>#</sup>If the second exam is not passed with  $\geq 70\%$ , the student will be required to do remedial work on the entire failed exam. This will be scheduled during a time determined by the instructor, when the student is not in a clinical rotation, (e.g., weekend, spring break, holiday break, after graduation). Upon completion of this remedial work, the student must successfully complete an oral examination with the primary UNMC or NMH course instructor.

## Course Topics:

<b>Topics</b>	<b>Associated Learning Objective Categories</b>
Introduction to Microbiology Activities include clinical experience	Introduction to Medical Microbiology Antimicrobial Susceptibility Testing Introduction to Virology
Bacteria Activities include clinical experience	Staphylococcus Streptococcaceae Gram-Positive Bacilli Aerobic Gram-Negative Cocci Enterobacteriaceae Haemophilus Fastidious Gram-Negative Bacilli Glucose Nonfermenting Gram-Negative Bacilli Campylobacter and Helicobacter Oxidase Positive Fermenting Gram-Negative Bacilli Anaerobes Mycobacteriaceae Spirochetes Yeast
Note: Both of the above are incorporated into Bacterial Cultures.	
Bacterial Cultures  Activities include clinical experience	Respiratory Cultures Urine Cultures Stool Cultures Blood and Catheter Tip Cultures Sterile Body Fluid and Tissue Cultures Genital Tract/Sexually Transmitted Diseases Wound Cultures
Parasitology Activities may include clinical experience	Introduction to Parasitology Protozoa – Amoeba Protozoa – Flagellates Protozoa – Ciliates Protozoa – Sporozoa Helminths – Nematodes (Roundworms) Helminths – Cestodes (Tapeworms) Helminths – Trematodes (Flukes)
Mycology Activities may include clinical experience	Basics of Mycology Yeast Systemic Dimorphic Fungi Opportunistic Molds Subcutaneous Fungi Dermatophytes
Serology Activities include clinical experience	Spirochetes Epstein-Barr Virus (EBV) /Infectious Mononucleosis Mycoplasma Pneumoniae / Cold Agglutinins Streptococcal Antibody Testing Miscellaneous Serology Testing Human Immunodeficiency Virus (HIV) Autoimmunity Hepatitis Virus

**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.

## 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.