Course Title: Clinical Laboratory Operations
Course Number: MLS 407
Credit Hours: 2 semester hours
Prerequisites: Enrollment in the Medical Laboratory Science Program
Semesters offered: Fall (and Spring for DAO students only)
Course Coordinator: Sandra Latshaw, MA, MT(ASCP)SM  sjlatsha@unmc.edu
402-423-9193
Course Curriculum Planning Committee: Marnie Imhoff, MBA, MLS(ASCP)CM  mimhoff@unmc.edu
Kaylyn Rogers, MT(ASCP)BBSM  kaylyn.rogers@unmc.edu
Nicole Smith, MT(ASCP)  nsmith@nebraskamed.com
Course Faculty: Team taught by MLS faculty members; refer to each unit for the primary faculty contact.
Class Days, Times, Location:
Monday – Friday, 0800-1630, for two weeks: May 18 – June 1, 2016.
Schedules for Degree Advancement Option (DAO) students will be individually established.
Course Description:
This course provides a basic introduction to the theory, practical application, technical performance and evaluation of laboratory skills specific to the practice of clinical laboratory science. Laboratory safety; microscopy; pipetting; general laboratory equipment; quality control; mathematics; phlebotomy; pre-analytic, analytic and post-analytic processes, including specimen collection, processing and transport to maintain test result integrity, will be addressed.
Instruction:
Instructional methods will include independent reading assignments, worksheets, lectures, small group discussions, case studies, exercises, simulation of clinical laboratory procedures and results, archived presentation sessions, online synchronous and/or asynchronous delivery and student laboratory experience.
Course Goals:
Upon successful completion of this course, the Medical Laboratory Science student will:
1. Demonstrate a basic knowledge of the theory and techniques used in standard laboratory procedures performed in clinical laboratories.
2. Demonstrate safety practices at all times in all clinical rotations.
3. Demonstrate basic technical skills, including the ability to follow procedural steps, operate a brightfield microscope, and choose and operate macro-volume and micro-volume pipettes appropriate for the intended purpose and outcome.
4. Understand the role of quality control and assessment of specimen integrity in evaluating the validity of test results.
5. Effectively communicate with the instructors and peers
Required Textbooks:
   *This text will be required for Clinical Chemistry and Urinalysis I and II.
   *This text will be required for Clinical Chemistry and Urinalysis I and II.

Additional References:
3. Additional references will be provided.

Grading System:
- Homework quizzes (all units) = 15%
- Clinical Laboratory Safety unit = 5%
- Pre-Analytic Process unit = 8%
- Laboratory Procedure Format unit = 5%
- Laboratory Math unit = 5%
- Pipetting Concepts unit = 8%
- Introduction to Quality Control unit = 8%
- Patient Safety unit = 5%
- Analytic/Post-Analytic Process unit = 8%
- Phlebotomy unit = 8%
- Microscopy unit = 10%
- Comprehensive Final Exam = 15%

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
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<tbody>
<tr>
<td>A+</td>
<td>97.00-100.00</td>
</tr>
<tr>
<td>A</td>
<td>93.00-96.99</td>
</tr>
<tr>
<td>A-</td>
<td>90.00-92.99</td>
</tr>
<tr>
<td>B+</td>
<td>87.00-89.99</td>
</tr>
<tr>
<td>B</td>
<td>83.00-86.99</td>
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<tr>
<td>B-</td>
<td>80.00-82.99</td>
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<td>C+</td>
<td>77.00-79.99</td>
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<tr>
<td>C</td>
<td>73.00-76.99</td>
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<tr>
<td>C-</td>
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<td>D-</td>
<td>60.00-62.99</td>
</tr>
<tr>
<td>F</td>
<td>00.00-59.99</td>
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Grade Requirements:
1. An overall course average of ≥70%. If the overall course average is <70%, an opportunity for make-up work may be provided*; the student may be put on academic probation or subject to dismissal.
2. 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. This additional work will not alter the student’s earned grade.
3. If a student does not successfully meet each of the above grade requirements, a grade of F (failing) will be assigned for the course.

*Once this required work has been successfully completed on the initial attempt, the student will obtain an altered score or average of 70%. If the required work is not successfully completed on the initial attempt, the student may be put on academic probation and/or dismissed from the program based on the policy manual.
**Course Topics:** See Grading System

**Schedule:**
DAO students: due dates do **not** apply; course will be self-paced within the registered semester

<table>
<thead>
<tr>
<th>2016</th>
<th>Unit/Activity</th>
<th>Assignment due online by date and (central time)</th>
</tr>
</thead>
</table>
| Tues. May 17 | Student Orientation  
Laboratory Math Competency Assessment  
*Clinical Laboratory Safety Homework* | May 18 (0800) |
| Wed. May 18 | Clinical Laboratory Safety in-class and lab activities  
*Microscopy Homework*  
Microscopy in-class activity  
*Pre-Analytical Process Homework* | May 19 (0800)  
May 18 (1400) |
| Thur. May 19 | Microscopy lab #1  
*Pre-Analytical Process Homework*  
Pre-Analytical Process in-class activity  
*Phlebotomy Module #1 Homework*  
*Laboratory Procedure Format Homework* | May 19 (1230) |
| Fri. May 20 | Phlebotomy open discussion and in-class activity #1  
*Pre-Analytical Process lab #1*  
Laboratory Procedure Format in-class activity #1  
Microscopy lab #2  
*Laboratory Math Modules #1-5 Homework* | May 23 (1200) |
| Mon. May 23 | Phlebotomy practice pad #1  
*Pre-Analytical Process lab #2*  
Laboratory Math in-class activity for Modules #1-3  
Laboratory Procedure Format in-class activity #2  
*Pipetting Concepts Homework* | May 24 (1230) |
| Tues. May 24 | Phlebotomy practice pad #2  
Laboratory Math in-class activity for Modules #4-5  
Pipetting Concepts in-class activity and lab #1  
*Introduction to Quality Control Modules #1-3 Homework* | May 25 (0800) |
| Wed. May 25 | Introduction to Quality Control Modules #1-3 in-class activity and lab  
Pipetting Concepts lab #2  
Optional Math open work session  
Optional Phlebotomy practice pad lab  
*Introduction to Quality Control Modules #4-6 Homework* | May 26 (0800) |
| Thur. May 26 | Introduction to Quality Control Modules #4-6 in-class activity and lab  
Phlebotomy venipuncture lab #1  
Microscopy lab #3  
*Analytical/Post-Analytical Processes Homework*  
*Patient Safety Homework* | May 27 (0800)  
May 27 (1030) |
| Fri. May 27 | Analytical/Post-Analytical Processes in-class activity and lab  
Patient Safety in-class activity  
*Phlebotomy Module #2 Homework* | May 31 (0800) |
| Mon. May 30 | Memorial Day Break | |
| Tues. May 31 | Phlebotomy in-class activity #2  
Phlebotomy capillary draw #1, practice pad #3, & venipuncture lab #2 | |
| Wed. June 1 | Clinical Laboratory Operations Comprehensive Exam  
Microscopy lab #4 | |
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 http://www.unmc.edu/stucouns/services/disabilities/. 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.