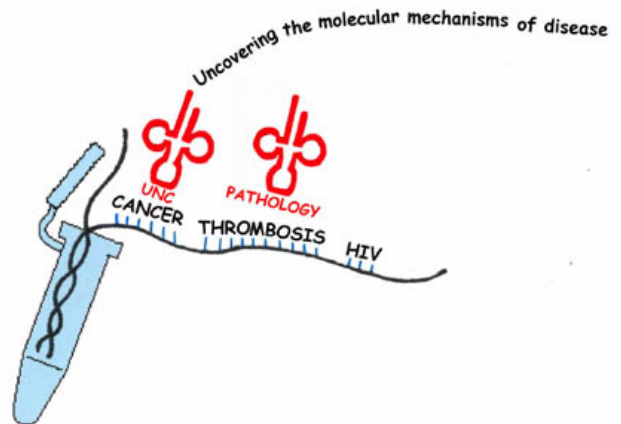
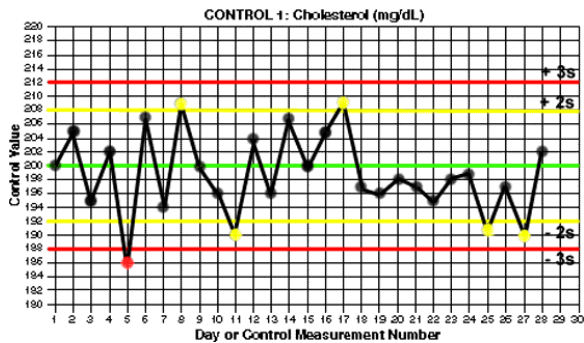
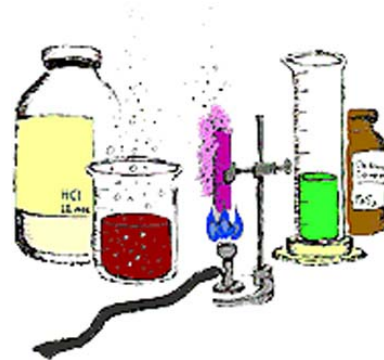
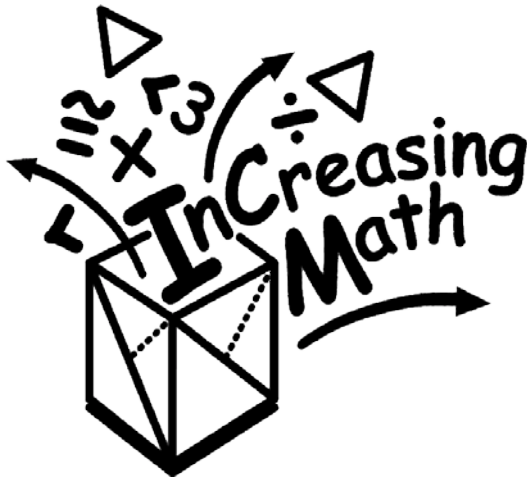


Clinical Laboratory Statistics

Mathematics for the Clinical Laboratory

TBL - Team Base Learning
Spring 2024

Syllabus



This course aligns with Healthy People 2020

**The University of Texas at El Paso
College of Health Sciences
Clinical Laboratory Science Program**

Spring 2024

Course: *CLSC 2212: Clinical Laboratory Statistics*
CRN- 25507

Instructor: Elizabeth Camacho, MATS, MT (ASCP) Molecular Diagnostics Certificate

Instructor Contact Information:

Office: College of Health sciences & School of Nursing (CHSSN) 425

E-Mail Address: ecamacho@utep.edu

Phone: (915) 747-8596

Fax: (15) 747-8224 or (915) 747-7207

OFFICE HOURS: Monday from 10:00 to 12:00 pm

If for some reason, you are not able to see me at this time. You are welcome to see me after class or we can arrange an appointment. You can also schedule meetings with me by e-mail. I would like to invite you to use the office hours to clarify points you did not understand in lecture, to discuss subject matter according to your special interests or talk about your career goals. Please do not wait until the last minute if you feel confused and lost, please come, and see me. The best time to reach me by phone is during my office hours. If I am not here, please leave a detailed message and I'll try to return your call as soon as possible.

COURSE DESCRIPTION

This class will focus on mathematical topics, computations and methods most often used in clinical and medical laboratories, with special emphasis on the clinical calculations used in each of the areas of the laboratory to ensure accurate patient results. Specific topics will include basic mathematical principles and systems of measurement; dilutions, solutions, ionic strength; calculations for specific areas of the clinical laboratory; and statistical calculations used to measure and maintain quality control. Application problems and hands-on laboratory exercises will help reinforce materials presented in class and give the students the opportunity to assess their mastery of the various mathematics topics discussed.

Course goals:

- At the end of this course the student will have an understanding of the basic mathematical principles and calculations used in clinical laboratory testing as

well as those associated with quality assurance, quality control and method comparison.

- Students will develop analytical thinking and problem-solving skills to be able to identify, troubleshoot and discuss laboratory calculations and findings.

ORGANIZATION OF THE COURSE: This course is built around 15 learning units that focus on critical instruction that shape and challenge the student's learning and understanding in this course material. This is an essential component in the CLS profession because everything that is learned during the career is vital to know because a patient's health and life depend on the work we do as team members of the health care team.

Working with your peers in CLSC 2212

A key element of your experience in this course with the collaboration with other students. You will be a member of a team, and all your team-based work will take place in class, so you don't need to worry about having to schedule additional meetings outside of class.

Why Teams?

In this course, it's not the lectures that matter so much, but rather your own interpretation and analysis of the readings that count. The team assignments are designed to give you a chance to compare your ideas with those of other students, and to refine your own thinking. This "discussion and debate" approach to the ideas of this course will serve you very well-much better than simply listening to lectures. This course is not merely about "how much can you memorize" –instead, this course asks you to find answers to questions such as:

- What is the impact that "Clinical Laboratory Computations" course will have on my career?
- What is the importance of "Clinical Laboratory Computations" course in patient's health and life?

These kinds of questions cannot be answered completely by any one individual-they are too complex, and there can be considerable debate and disagreement about the answers.

Your role in the course

To be ready for this type of experience, it will be important for you to read and prepare outside of class. Your preliminary knowledge and understanding of the readings will be essential for success with in-class activities and assignments, many of which will take place in collaboration with your team.

COURSE OBJECTIVES:

A. Cognitive

1. State the rules and perform mathematical calculations using/involving scientific notation.
2. Describe units of measure commonly used in the clinical laboratory in terms of their relationship to the applicable system of measure and the relationship of the unit to the system, i.e., measurement of length, weight, mass and temperature.
3. Recognize, describe major types of solutions; calculate, determine all components related to dilutions, titers, concentrations, and volumes.
4. Define the molarity, normality, mole, molar, molality, equivalent weight and be able to calculate the above concentrations in solutions.
5. Describe quality assurance and quality control in the clinical laboratory. Define and calculate various parameters used QA/QC assessment.
6. Plot QC results on a Levey-Jennings chart and evaluate the acceptability of results using Westgard rules.
7. Compare and contrast systematic and random errors.
8. Apply mathematical calculations to specific clinical areas in the laboratory, i.e. Chemistry, Hematology, Urinalysis, Immunohematology and Microbiology.

B. Affective

To show the appropriate responsible behaviors, students will demonstrate:

1. A positive attitude by being prepared for lecture and laboratory sessions completing assigned tasks on time and displaying self-motivation.
2. Organization by utilizing time effectively, sequencing, and prioritizing tasks for completion with time constraints.
3. Attention to detail by diligently pursuing accuracy and documenting data accurately and legibly.

4. Problem solving ability by explaining the purpose of each step-in diagnosis, interpretation, procedure, recognizing discrepancies in techniques or procedures and repeating necessary lab tests when necessary.
5. Dependability by following directions, working independently after being given directions.
6. Stability and self-confidence by approaching and performing routine tasks confidently without assistance and maintaining composure.
7. Appropriate interpersonal skills by cooperating and communicating effectively with classmates and instructors and displaying courteous, considerate behavior and appropriate appearance.
8. Ethical behavior and integrity by respecting confidentiality of patient information, complying with professional standards and code of ethics, adhering to safety policies, and abiding by all rules and regulations of the institution.

Required Materials:

Students must be able to access on-line materials via a computer with Internet access, either from home or some other place, such as a library or learning resource center. High-speed Internet connection is preferable to more quickly download information. Visit the UTEP Blackboard website to see the computer system requirements and for any software downloads. The schedule (including open lab hours) for computer lab (Library 3rd floor) or you can contact the ILC.

Required Text:

- Lorraine J. Doucette. Mathematics for the Clinical Laboratory. fourth Edition. Evolve Elsevier. 2020.

COURSE POLICES:

Class Schedule and Communications: Monday from 2:00 – 5:00 pm

Rm: 135 CHSSON

UTEP's Blackboard provides several built-in communication tools which will be used for interaction and communication.

REQUIREMENTS:

Course Policies to Enhance Everyone's Learning

Use of Digital Devices such as iPads, Laptops, etc.:

Learning can be helped greatly by the use of digital devices, but they also often disrupt learning by drawing your attention away from the task at hand. To optimize

learning in class, please, adhere to some basic common-sense rules:

- **Cell Phones, Tablets, and Laptops:** Silence the phone prior to class. Use your device only for class-related activities that require accessing your ebook, electronic notes, SG or the Internet for specific tasks. Respect your learning, act as a responsible professional, and use the devices appropriately.
- **Emergencies:** Please advise your instructor and your team in a timely manner if you are expecting a **life-altering call**. When you receive the call, leave quietly so you do not disturb others, and answer the call outside the classroom.

Class Format

Class Attendance and Participation: The student is expected to attend all classes and be on time, and actively participate. It is the responsibility of the student to notify the instructor of any absence and to provide legitimate documentation of absence to abide to university regulations. The instructor reserves the right to drop a student due to tardiness or absences when in the judgment of the instructor, a student has been absent to a degree as to impair his or her status relative to credit for the course. The instructor may drop the student from the class with a W before the course drop deadline or with an F after the course drop deadline.

2) The materials for this course are mostly located in the textbook, along with other learning tools found online at the UTEP Blackboard site. You, the student, spend time reading the text, reviewing the power point presentations, studying the examples/descriptions, and practicing the material by doing the example problems at the end of each chapter as well as, the study guide assignments found on Blackboard. This will require you to schedule periods of uninterrupted time for your math class studies. We will also have scheduled group discussions in the classroom. You are encouraged to set up individual meetings with me if you're having difficulty with any of the course materials.

The topic outline schedule indicates the topics to be covered within an appropriate time frame. Feel free to work ahead of schedule whenever the topics are easier for you to understand. Spend more time on the topics most difficult for you. However, do NOT fall behind the suggested schedule or you may have difficulty completing the course material before the scheduled exam dates and/or the end of the semester.

Assignments

After you have read each section or topic and reviewed the power point presentations, complete as many of the (SG) Study guide practiced problems at the end of the chapter as you can. Learning mathematics is like learning to play a

musical instrument; it takes lots of practice! So, PRACTICE! The SG assignments on the Blackboard homepage are to be completed and submitted on the scheduled date.

Submitting (SG) Study Guide Assignments

1. Scan your (SG) assignments, save them as a pdf file and submit them via Blackboard.
2. Problems from end of the chapter should be done, saved as pdf file and submit via Blackboard by the deadline.

In order for the assignments to be beneficial to you, they should be submitted as scheduled.

Assignments sent to my email will not be accepted.

Grading Information

ASSESSMENT AND EVALUATION COMPONENTS

Your grade for CLSC 2212 will be composed of three parts:

- **Overall individual performance** refers to assignments where you receive your own, individual grade.
- **Overall, Team Performance:** refers to assignments where every member of the team receives the same grade.
- **Helping Behavior:** refers to the marks your peers will assign to your overall contribution to the team during the semester. Details of how you will be able to receive points and assign points to your teammates will be distributed later in the semester.

Helping Behavior Evaluation

You will develop the standards for Helping Behavior as a class. During the semester, you will evaluate your teammates' **helping behavior** after select team assignments. After you finish the final exam, you will complete a final evaluation of your teammates' helping behaviors. This evaluation will affect the team component of the course grade.

You want to be a Professional, and **Professionals come Prepared** to their meetings (class). I and your teammates expect this from you.

Exams: A total of 5 exams will be given during the semester. Please see the “Dates of exams and Material to be covered” below and/or the “Course Schedule” for exam dates.

If you cannot take an exam for a legitimate reason (death, illness etc.) inform me as soon as possible and we will arrange a future time for you to access the exam. If you fail to take an exam during the scheduled time with no notification, **10 points will be deducted from your make-up exam score.** Make-up exams/quizzes, while they may cover

the same material, may differ from the exam/quiz taken by the rest of the class in organization, format, or specific item data.

Dates of Exams and Material to be covered:

Exam 1 – covers chapters 1-3- February 5, 2024

Exam 2 – covers chapters 4 & 5 - February 19, 2024

Exam 3 – covers chapters 6 & 7 – March 18, 2024

Exam 4 – covers chapters 8, 9 & 10 – April 8, 2024

Exam 5 – covers chapters 12, 13 & 14

**Final Exam – covers (Comprehensive – Chapters 1-15)
May __, 2024, Date, Room and Time TBA.**

Weights

5 exams will be given 10% each – Total 50%

One Final exam will be given 20%

There will be Individual Readiness Assessment– Total 10% (There will be no makeup quizzes available for any reason.

Practice Problems - SG Assignments 5% (Blackboard) - Submit before class.

Grades

85%	Overall Individual Performance	15%	Overall Team Performance
10%	Individual Readiness Assessment	5%	Group Readiness
50%	(5) Individual Exams 10% each	5%	(5) Capstone
20%	Individual Test Final	5%	Helping Behavior
5%	SG – Study Guide Assignments		

Grading Criteria

Grades are as follows:

- A 90 -100**
- B 80 -89**
- C 75 -79**
- D 70-74.9 ***
- F below 69.9**

* A grade of ‘C’ or better is required for admission to the UTEP CLS Program.

Major Mistakes Students Made in the Past that Negatively Affected Their Grades:

- 1) Not actively contributing to teamwork.
- 2) Being absent when in-class assignments were selected for grading.
- 3) Procrastinating, not working in advance of a deadline and missing it.
- 4) Having poor time management skills and strategies leading to not putting in the necessary work and time outside of class.

5) Scholastic dishonesty

Attendance

The student will be expected to attend the class sessions, communicate with the instructor via email or call the office number (747-8596) for any absences.

Attendance itself is not graded in this course. Instead in-class assignments constitute a large part of the course grade, and keeping a passing average on these is not possible without consistent attendance. Missing class means earning no credit for the assignment or assignments missed. For team assignments, you have to be present to earn credit. More importantly, missing assignments may also affect your relationship with your teammates, who will evaluate your participation at the end of the course.

Tardiness

If you come late to class and miss an assignment that happened at the beginning of class, the score for the assignment is “0”. Likewise, if you need to leave class early and miss an assignment, the score for the assignment is “0”. If you know that it will be difficult for you to consistently get to class on time and stay for the entire period, you should consider taking this course at a time that better fits your schedule.

Make-up

In this course, since much of the credit will be earned through in-class work of your other team members, make up work is impossible. Since there will be occasions in your life when missing a class meeting is simply unavoidable, this course has two built-in safety valves.

Safety Valve One: You may drop 1 individual and 1 group score from the RATs (Readiness Assessment Tests) whether the scores are “0” or simply lower than you want. So, if you must miss class for any reason, it will be possible to drop the zero you would automatically receive for missing the RAT. Plan carefully for classes that you know you will need to miss: You don’t want to waste your drop on frivolous things early in the semester, since you may need it if you have problems later on. You might need your droppable grade to offset any low scores you make even when you DO attend regularly.

Safety Valve Two: If you become seriously ill during the semester, or become derailed by unforeseeable life problems, and have to miss so many assignments that it will ruin your grade, you and I will automatically schedule a special meeting in order to make arrangements for you to drop the course to save your grade point average. Don’t wait until too late to see me when you get in trouble.

Policy for turning in late assignments:

(SG) assignments submitted on the due date are eligible for full marks. Any homework you choose to submit later than the due date will be accepted but will be eligible for a lower mark. For example, if an assignment is due on Monday morning, but you choose to submit it on Tuesday afternoon, it will only be eligible for a “B”. By Wednesday afternoon the same assignment will only be eligible for a “C”: In-class writing may be submitted only on the days they are scheduled.

***Students in Need of Assistance:** If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass. CASS’ Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*

STUDY TIPS:

1. **TIME MANAGEMENT** - It is critical that you manage your time wisely. Plan in advance to study EVERY DAY. Organize yourself by planning a schedule. In this schedule you may want to record times for reading, reviewing and studying for tests. Adjust your schedule as the course progresses. Pace the course workload evenly. Use a study location free of distractions and review periodically.
2. **MAKING USEFUL NOTES** - Identify new ideas, summarize main ideas from lecture or text, create outlines, flow charts, trees, concepts; underline selectively and rewrite your notes.
3. **READING TO LEARN** - **Determine your purpose for reading; preview the text (titles, summaries, diagrams); turn titles and headings into questions; read for main ideas; re-read, visualize, relate; review.**
4. **STUDY WITH OTHERS** - Study groups are one of the best ways of learning. Review the subject, formulate questions and discuss main ideas. Share notes and quiz each other for knowledge. Explain what you have learned to others. Synergism works with people and the group can inspire individuals to greater achievement and build confidence.

5. **SEEK COUNSEL** - If you are having difficulties, email or call me so that you can set up an appointment.
6. **STRESS REDUCTION** - When taking tests always study several times and over several days before taking the test. Overnight cramming produces confusion, anxiety, and poor learning. If you have test anxiety, learn relaxation techniques to calm yourself so that you can perform at your best. Make sure you are well nourished and rested. Take a walk or do other physical activity to release anxiety.

Scholastic Honesty

The University has policies and discipline procedures regarding scholastic dishonesty. Detailed information is available on the UTEP's Dean of Students' Guidelines: <http://www.utep.edu/dos/acadintg.htm>. All students are expected to maintain a high level of responsibility with respect to academic honesty. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Course Evaluation

As required by UT academic regulations, every student must complete an evaluation for each enrolled course at the end of the semester. An online instructional assessment form will be made available for your confidential use. Please look for the course evaluation link on the course Homepage towards the end of the course.

Technology Requirements/Support

This class makes extensive use of Blackboard® (<https://adminapps.utep.edu/blackboardlearn>).

You will use Blackboard to download/print lectures and other course materials, access assignments, and check your grades. Please note that your login and password are the same as you would use to access your UTEP email account. Ensure your UTEP e-mail account is working and that you have access to the Web. You may use any of the primary Web browsers—Explorer, Google Chrome, Firefox, Safari, etc. When having technical difficulties, try switching to another browser.

You will need to have or have access to a computer/laptop, printer, scanner, a webcam, and a microphone. You will need to purchase a USB (flash drive). You will need to download or update the following software: Microsoft Office, Adobe, Flashplayer, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course. The IT Support Team can assist with Blackboard, password resets, and student e-mail accounts. Hours and other helpful information can be found at <http://www.helpdesk.utep.edu>.

Course Drop policy

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email.

Accommodations Policy

The University is committed to providing reasonable accommodations to students with documented disabilities. Students who become pregnant or have parenting responsibilities may also request reasonable accommodations, in accordance with state and federal laws and regulations and University policy. Accommodations that constitute undue hardship are not reasonable. To make a request, please register with the UTEP Center for Accommodations and Support Services (CASS). Contact CASS at 915-747-5148, email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

Guidance on Artificial Intelligence

Use of AI technologies or automated tools, particularly generative AI such as [ChatGPT](#) or [DALL-E](#), is **only allowed with approval from the instructor BEFORE being used**. Without permission, you will be expected to think creatively and critically to complete assignments without assistance from these tools.

If given permission to use any of these tools, students must properly cite and give full credit to the program used upon submission of every relevant assignment. For example, text generated using ChatGPT must be cited:

Chat-GPT(version). Date of query (year/month/day). “Text of your query.”
Generated using OpenAI. <https://chat.openai.com/>

A short paragraph describing how the tool(s) was/were used for the assignment must be included.

Some AI technologies or automated tools, particularly generative AI such as [ChatGPT](#) or [DALL-E](#), can be beneficial during the early brainstorming stages of an activity, and you are welcome to explore them for that purpose. However, keep in mind that AI-generated ideas are not your own and may hinder your ability to think critically and creatively about a problem. It is also important to remember that these technologies often “hallucinate” or produce materials and information that are inaccurate or incomplete—even providing false citations for use.

That said, **you are not allowed to submit any AI-generated work in this course as your own**. If you use any information or materials created by AI technology, you are required to cite it like you would any other source. Consider how this will affect your credibility as a writer and scholar before doing so. Any direct use of AI-generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Student Conduct and Conflict Resolution (OSCCR).

Harassment:

Please be aware that harassment is unacceptable in the classroom. No jokes, comments of sexual nature as well as racists will be tolerated. The student that uses harassment will be sent to the Dean of students for disciplinary action.

Student Support Services:

UTEP provides a variety of student services and support. Please refer to the QR code below for a listing of campus resources.



Clinical Laboratory Statistics 2212
TBL- COURSE SCHEDULE
Spring 2024

Monday 2 to 5 PM ***Room: 135***

WEEK	DATE	TOPIC/CHAPTER	EXAM/QUIZ Capstone
1	January 15	<i>Dr. Martin Luther King, Jr. Birthday- University Closed</i> <i>Basic Arithmetic, Rounding Numbers and Significant Figures (Ch. 1)</i>	
2	January 22	<i>Syllabus/Introduction/Team Formation -Ch. 2 Scientific Notation, and Logarithms. -</i>	Quiz Ch. 1&2
3	January 29	<i>Ch. 3 Systems of Measurement</i>	Quiz Ch. 3 Capstone #1
4	February 5	Exam # 1 – Ch. 1, 2, & 3 (1 hour and 30 minutes) Ch. 4 – Dilutions and Titers	Exam # 1
5	February 12	Ch. 5 – Calculations Associated with Solutions	Quiz Ch. 4&5 Capstone #2
6	February 19	Exam # 2 – Ch. 4 & 5 (1 hour and 30 minutes) Ch. 6 Clinical Chemistry Laboratory	Exam #2
7	February 26	Ch. 6 Clinical Chemistry Laboratory	Quiz Ch.6
8	March 4	Ch. 7 Urinalysis Laboratory	Quiz Ch. 7 Capstone #3
	March 11-15	SPRING BREAK	
9	March 18	Exam #3 Ch. 6 & 7 (1 hour and 30 minutes) Ch. 8 Hematology Laboratory	Exam #3
10	March 25	Ch. 8 Hematology Laboratory Ch. 9 Immunohematology Laboratory	Quiz Ch. 8
11	April 1	Ch. 10 Microbiology Laboratory	QuizCh.9&10 Capstone #4
12	April 8	Exam # 4- Ch. 8, 9 and 10 (1 hour and 30 minutes) Ch. 12 – Quality Assurance in the Clinical Laboratory: Basic Statistical Concepts	Exam #4
13	April 15	Ch. 12 – Quality Assurance in the Clinical Laboratory: Basic Statistical Concepts Ch. 13 – Quality Assurance and Quality Control in the Clinical Laboratory	Quiz Ch. 12
14	April 22	Ch. 14 Comprehensive Laboratory Quality Assurance	Quiz Ch. 13 & 14 Capstone # 5
15	April 29	Exam #5 Ch. 12, 13 & 14 (1 hour and 30 minutes) Ch. 11 Molecular Diagnostics Laboratory Ch. 15 – Infrequently Performed Calculations	Exam #5
16	May ____	Final Exam TBA – Week of May- 6-10 th - COMPREHENSIVE	