



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



CLSC 3365: Clinical Chemistry II
Syllabus
Spring 2021

I. Course Information

Asynchronous Online Course via: Blackboard and Blackboard Collaborate Ultra
Textbook: Bishop, Michael L., Fody, Edward P., Schoeff, Larry E. 2018. *Clinical Chemistry. Principles, Techniques and Correlations. 8th Edition.* Wolters Kluwer.

II. Instructor Information

Instructor: Nancy Cruz, MS, MLS (ASCP)^{CM}

Email: ndcruzsanch@utep.edu

Office: College of Health Sciences (CHS) Room 426

Office Phone Number: 915-747-7243

Office Hours: via Blackboard Collaborate Ultra:

Mondays:

Tuesdays:

Wednesdays:

- **In order to better assist you, please make sure you schedule an appointment. If you cannot schedule during these times, please contact me (after class/lab or via email) to schedule another time.**
 - o Also available after class/lab.
- **Multiple students may be scheduled for the same office hour session. If it is a private matter or you wish to discuss material or have questions and prefer to have a private online office hour session, please make sure to notify the instructor when appointment is being made.**
- **Students must use their UTEP email when communicating, for appointments, questions, etc.**

III. Course Description

This course is designed for students in the clinical laboratory science program. It is a continuation of CLSC 3354: Clinical Chemistry I. The course intends to provide clinical chemistry theory and principles with a focus on organ system function like hypothalamic, pituitary, adrenal, gonadal, thyroid, and liver function as well as cardiac and tumor markers and toxicology. It also discusses the analytical techniques performed to detect and/or quantify each analyte in the clinical laboratory setting.

Course co-requisite: CLSC 3164 – Clinical Chemistry II Laboratory

Course pre-requisite: CLSC 3354 and CLSC 3155 (Each with a grade of “C” or higher and department approval.)

IV. Course Goal

This course intends to provide the student with clinical chemistry foundations, principles and theory regarding analytes tested in the clinical chemistry laboratory, their physiological-biochemical purpose, pathways, the importance of each of them in organ/system function, and an understanding of the analytical techniques used to determine analyte presence and/or concentration in a specimen. Likewise, the student will learn to accurately distinguish between abnormal and normal results and, will evaluate and analyze such results using patient clinical history and evidence. The student will need to:

- Apply basic understanding of clinical chemistry learned in CLSC 3354: Clinical Chemistry I toward various body systems.
- Demonstrate an understanding of the instrumentation and laboratory techniques utilized in clinical chemistry laboratory settings.
- Demonstrate a functional understanding of the analytical calculations employed in standard clinical chemistry laboratories and be able to apply them in classroom and clinical settings.
- Understand the importance of consistent method and sample evaluation in the clinical laboratory
- Identify how deviations from standard operating procedures and/or poor sample quality can affect the validity of test results and effectiveness of patient care.
- Understand the importance of quality control measures and reference values, particularly as they pertain to clinical chemistry.
- Understand the clinical significance of clinical chemistry technical data and its correlation with normal and abnormal physiologic conditions.
- Demonstrate and employ effective interpersonal, professional and group communication skills.
- Have a thorough understanding of the pre-analytical, analytical and post-analytical issues for sample preparation, analysis and reporting.

V. Course Objectives

A. Cognitive

Upon completion of this course the student will be able to do the following accordingly to each chapter:

1. Chapter 20: Hypothalamic and Pituitary Function
 - a. Describe the functions of the anterior and posterior pituitary.
 - b. Define the anatomic relationship between the pituitary and hypothalamus.
 - c. Discuss the concept of open-loop negative feedback and relate this to the function of the various hypothalamic-pituitary-endocrine target gland loops.

- d. Describe the effects of pulsatility and cyclicity on the results of hormone measurements.
 - e. Differentiate between tropic and direct effector in relationship to pituitary hormones.
 - f. Discuss the regulation of prolactin secretion.
 - g. State the non-neoplastic causes of prolactin elevation.
 - h. Explain the difference between primary and secondary endocrine deficiency states.
 - i. Describe the clinical features of the excess and deficiency states for growth hormone, prolactin and vasopressin.
 - j. Relate the physiology underlying the strategies used for screening and definitive testing for suspected disorders of growth hormone.
2. Chapter 21: Adrenal Function
- a. Explain how the adrenal gland functions to maintain blood pressure, potassium, and glucose homeostasis.
 - b. Describe steroid biosynthesis, regulation, and actions according to anatomic location within the adrenal gland.
 - c. Discuss the pathophysiology of adrenal cortex disorders, namely, Cushing's syndrome and Addison's disease.
 - d. List the appropriate laboratory tests to differentially diagnose primary and secondary Cushing's syndrome and Addison's disease.
 - e. Differentiate the adrenal enzyme deficiencies and their blocking pathways in establishing a diagnosis.
 - f. Describe the synthesis, storage, and metabolism of catecholamines.
 - g. State the most useful measurements in supporting the diagnosis of pheochromocytoma.
 - h. List the clinical findings associated with hypertension that suggest an underlying adrenal etiology is causing high blood pressure.
3. Chapter 22: Gonadal Function
- a. Discuss the biosynthesis, secretion transport, and action of the sex steroids and gonadotropins.
 - b. Identify the location of the pituitary, ovaries and testes.
 - c. Describe the hypothalamic-pituitary-ovarian and hypothalamic-pituitary-testicular axes and how they regulate sex steroid and gonadotropin hormone production.
 - d. Explain the principles of each diagnostic test for pituitary-gonadal axes dysfunction.
 - e. Correlate laboratory information regarding suspected gonadal disorders, given a patient's clinical data.

- f. Describe the appropriate laboratory testing protocol to effectively evaluate or monitor patients with suspected gonadal disease.
4. Chapter 23: The Thyroid Gland
 - a. Discuss the biosynthesis, secretion, transport, and action of the thyroid hormones.
 - b. Know the location of the thyroid gland.
 - c. Describe the hypothalamic-pituitary-thyroid axis and how it regulates thyroid hormone production.
 - d. Explain the principles of each thyroid function test discussed.
 - e. Correlate laboratory information with regard to suspected thyroid disorders, given a patient's clinical data.
 - f. Describe the appropriate laboratory thyroid function testing protocol to use to effectively evaluate or monitor patients with suspected thyroid disease.
5. Chapter 24: Calcium Homeostasis and Hormonal Regulation
 - a. Describe the endocrine and organ physiology of calcium metabolism.
 - b. Discuss the laboratory tools used to evaluate calcium metabolism.
 - c. Apply the laboratory tools to clinical disease states of calcium metabolism.
6. Chapter 25: Liver Function
 - a. Diagram the anatomy of the liver.
 - b. Explain the following functions of the liver: bile secretion, synthetic activity, and detoxification.
 - c. List two important cell types associated with the liver and state the function of each.
 - d. Define jaundice and classify the three different types of jaundice.
 - e. Discuss the basic disorders of the liver and which laboratory tests may be performed to diagnose them.
 - f. Evaluate liver-related data and correlate that data with normal or pathology states.
 - g. Compare and contrast how total and direct bilirubin measurements are performed.
 - h. List the enzymes most commonly used to assess hepatocellular and hepatobiliary disorders.
 - i. Describe the various types of hepatitis to include cause, transmission, occurrence, alternate name, physiology, diagnosis, and treatment.

7. Chapter 26: Laboratory Markers of Cardiac Damage and Function
 - a. Diagram the anatomy of the heart.
 - b. Explain the origin of general symptoms of cardiac disease.
 - c. Discuss the etiology and physiologic effects of the following cardiac conditions:
 - Congenital heart disease
 - Hypertensive heart disease
 - Infectious heart disease
 - Coronary heart disease
 - Congestive heart failure
 - d. Identify the risk factors for coronary heart disease.
 - e. List features of an ideal cardiac marker.
 - f. List and briefly describe three novel markers of inflammation currently under investigation.
 - g. Compare and contrast the specificity and sensitivity of the most commonly used serum cardiac markers.
 - h. Assess the clinical utility of the various cardiac markers to assess myocardial infarction.
 - i. Analyze the role of the clinical laboratory in the assessment of a patient with cardiac disease.
8. Chapter 27: Renal Function
 - a. Diagram the anatomy of the nephron.
 - b. Describe the physiologic role of each part of the nephron: glomerulus, proximal tubule, loop of Henle, distal tubule, and collecting duct.
 - c. Describe the mechanisms by which the kidney maintains fluid and electrolyte balance in conjunction with hormones.
 - d. Discuss the significance and calculation of glomerular filtration rate and estimated glomerular filtration rate.
 - e. Relate the clinical significance of total urine proteins, albuminuria, myoglobin clearance, serum β_2 -microglobulin, and cystatin C.
 - f. List the tests in a urinalysis and microscopy profile and understand the clinical significance of each.
 - g. Describe diseases of the glomerulus and tubules and how laboratory tests are used in these disorders.
 - h. Distinguish between acute kidney injury and chronic kidney disease.
 - i. Discuss the therapy of chronic renal failure with regard to renal dialysis and transplantation.
9. Chapter 28: Pancreatic Function and Gastrointestinal Function
 - a. Discuss the physiologic role of the pancreas in the digestive process.

- b. List the hormones excreted by the pancreas, together with their physiologic roles.
- c. Describe the following pancreatic disorders and list the associated laboratory tests that would aid in diagnosis: acute pancreatitis, chronic pancreatitis, pancreatic carcinoma, cystic fibrosis, and pancreatic malabsorption.
- d. Describe the physiology and biochemistry of gastric secretion.
- e. List the tests used to assess gastric and intestinal function.
- f. Explain the clinical aspects of gastric analysis.
- g. Evaluate a patient's condition, given clinical data.

10. Chapter 29: Body Fluid Analysis

- a. Identify the source of amniotic fluid, cerebrospinal fluid, sweat, synovial fluid, pleural fluid, pericardial fluid, and peritoneal fluid.
- b. Describe the physiologic purpose of amniotic fluid, cerebrospinal fluid, sweat, synovial fluid, pleural fluid, pericardial fluid, and peritoneal fluid.
- c. Discuss the clinical utility and methods used to test amniotic fluid, cerebrospinal fluid, sweat, synovial fluid, pleural fluid, pericardial fluid, and peritoneal fluid.
- d. Correlate patient status when given appropriate laboratory results obtained from amniotic fluid, cerebrospinal fluid, sweat, synovial fluid, pleural fluid, pericardial fluid, and peritoneal fluid.
- e. Differentiate between a transudate and an exudate both in terms of their respective causes and laboratory results associated with each.

11. Chapter 30: Therapeutic Drug Monitoring

- a. Discuss drug characteristics that make therapeutic drug monitoring essential.
- b. Identify factors that influence the absorption of an orally administered drug.
- c. List factors that influence the rate of drug elimination.
- d. Define drug distribution and discuss factors that influence it.
- e. Calculate volume of distribution, elimination constant, and drug half-life.
- f. Relate the concentration of a circulating drug to pharmacokinetic parameters.
- g. Discuss collection of appropriate specimens for therapeutic drug monitoring.
- h. Identify the therapeutic category or use of each drug presented in this chapter.
- i. Describe complications that result from major toxicity of drugs presented in this chapter.

- j. Identify key features of each drug presented in this chapter that may influence its blood concentration.

12. Chapter 31: Toxicology

- a. Define the following terms: poison, toxicant, toxicology, toxin, xenobiotic, ED₅₀, LD₅₀, TD₅₀.
- b. Identify the primary routes for exposure and discuss factors that influence the absorption of an ingested toxin.
- c. Compare and contrast acute and chronic toxicity.
- d. List major toxicants.
- e. Define the pathologic mechanisms of the major toxicants.
- f. Identify common specimen types used in toxicology and discuss the benefits and drawbacks of each.
- g. Discuss the challenges of properly collecting and handling specimens for toxicology testing.
- h. Explain the differences between quantitative and qualitative tests in toxicology.
- i. Identify common qualitative and quantitative test methods used to evaluate toxicity in the clinical laboratory.
- j. Explain how the osmolal gap is calculated and used to evaluate the presence of osmotically active substances in blood and urine.
- k. Discuss the role of the clinical laboratory in the evaluation of exposure to toxins and poisons.
- l. Evaluate clinical laboratory data in suspected poisoning cases and provide recommendations for further testing.

13. Chapter 32: Circulating Tumor Markers: Basic Concepts and Clinical Applications

- a. Discuss the incidence of cancer.
- b. Explain the role of tumor markers in cancer management.
- c. Identify the characteristics or properties of an ideal tumor marker.
- d. State the major clinical value of tumor markers.
- e. Name the major tumor types and their associated markers.
- f. Describe the major properties, methods of analysis, and clinical use of α -fetoprotein, cancer antigen 125, carcinoembryonic antigen, β -human chorionic gonadotropin, and prostate-specific antigen.
- g. Explain the use of enzymes and hormones as tumor markers.

14. Chapter 33: Nutrition Assessment

- a. Discuss the contribution of individual nutrient classes to human metabolism.
- b. Discuss therapeutic nutrition support by enteral and parenteral routes.

- c. List biochemical parameters used to monitor nutritional status.
- d. Describe the biochemical roles of vitamins.
- e. Correlate alterations in vitamin status with circumstances of increased metabolic requirements, age-related physiologic changes, or pathologic conditions.
- f. Describe drug-nutrient interactions that influence vitamin status.
- g. Delineate laboratory procedures used in the assessment of vitamin status.
- h. Discuss the role of the laboratory in nutritional assessment and monitoring.
- i. List the populations at risk for malnutrition.
- j. Identify the plasma protein changes as a result of stress.
- k. Describe some of the electrolyte and mineral abnormalities associated with total parenteral nutrition.

15. Chapter 34: Clinical Chemistry and the Geriatric Patient

- a. Define aging, atherosclerosis, geriatrics, gerontology, homeostasis, menopause, and osteoporosis.
- b. Discuss the impact of geriatric patients in the clinical laboratory.
- c. Appraise the physiologic changes that occur with the aging process.
- d. Identify the age-related changes in clinical chemistry analytes.
- e. Explain the problems associated with establishing reference intervals for the elderly.
- f. Describe the effects of medication in clinical chemistry results in the elderly.
- g. Discuss the effects of exercise and nutrition on chemistry results in the elderly.
- h. Correlate age-related physiologic changes and laboratory results with pathologic conditions.

16. Chapter 35: Clinical Chemistry and the Pediatric Patient

- a. Define the adaptive changes that occur in the newborn.
- b. Describe the developmental changes that occur throughout childhood.
- c. Discuss the problems associated with collecting blood from small children.
- d. Understand the role of point-of-care testing in pediatric settings.
- e. Summarize the changes that occur in children with regard to electrolyte and water balance, endocrine function, liver function, and bone metabolism.
- f. Explain how drug treatment and pharmacokinetics differ between children and adults.

- g. Discuss the procedures used to diagnose inherited metabolic diseases.
- h. Describe the development and disorders of the immune system.

B. Affective

Upon completion of this course, the student will be able to exhibit the appropriate responsible behaviors by demonstrating:

To show the appropriate responsible behaviors students will demonstrate:

1. Educational initiative and a positive attitude by being prepared for 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. Adaptability and flexibility to change and learning.
4. Good judgement and exercise emotional intelligence by accepting personal responsibility for consequences of one's own actions.
5. Problem solving ability by explaining purpose of each step in: diagnosis, interpretation, procedure, recognizing discrepancies in techniques or procedures and knowing when repeating laboratory testing is necessary.
6. Dependability by following directions and working independently after being given directions.
7. Maturity, stability, and self-confidence by approaching and performing routine and stressful tasks confidently without assistance and maintaining composure, and by defining and being aware of personal limitations, seeking help when needed and pursuing continuing education independently.
8. Appropriate interpersonal skills by cooperating and communicating effectively with classmates and instructor(s) (faculty). Displaying courteous, considerate behavior and appropriate appearance.
9. Application of ethical behavior, integrity, and professionalism 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 CLS Program and the institution.
10. Commitment to organizational and professional policies regarding appearance, safety, confidentiality, and ethics by following UTEP's CLS Program Standards.

C. Psychomotor

1. Psychomotor skills will be evaluated in the laboratory: CLSC 3164: Clinical Chemistry II Laboratory.
2. Psychomotor objectives available in the CLSC 3164: Clinical Chemistry II Laboratory Syllabus.

VI. Course Policies

A. Textbook: Bishop, Michael L., Fody, Edward P., Schoeff, Larry E. 2018. *Clinical Chemistry. Principles, Techniques and Correlations. 8th Edition.* Wolters Kluwer.

B. Instructional Policies

1. This is an asynchronous course, material and resources for the class will be provided using the following:
 - a. Blackboard
 - b. Blackboard Collaborate Ultra
 - c. Yuja Media Library
 - d. You Tube

2. The student must have available or have access to the following technological resources:
 - a. Computer/laptop with camera (webcam), audio and microphone.
 - b. USB flash drive
 - c. Good internet connection
 - d. Microsoft Office (Word, Power Point, Excel)
 - e. Adobe (PDF) Flashplayer
 - f. Windows Media Player
 - g. Internet browser (i.e., Google Chrome, Mozilla Firefox)
 - h. Blackboard's Respondus LockDown Browser

3. LockDown Browser + Webcam Requirement
 - a. This course requires the use of LockDown Browser and a webcam for online quizzes and exams. The webcam can be the type that is built into your computer or one that plugs in with a USB cable. Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature.
 - <https://www.respondus.com/products/lockdown-browser/student-movie.shtml>

 - b. Download Instructions
 - Download and install LockDown Browser from this link:<https://download.respondus.com/lockdown/download.php?id=586140509>
 - Once Installed:
 - ◊ Start LockDown Browser
 - ◊ Log into Blackboard Learn
 - ◊ Navigate to the test
 - ◊ Note: You will not be able to access tests with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.

c. Guidelines

- When taking an online test, follow these guidelines:
 - ◊ Ensure you are in a location where you won't be interrupted
 - ◊ Turn off all other devices (e.g., tablets, phones, second computers) and place them outside of your reach
 - ◊ Before starting the test, know how much time is available for it, and that you have allotted sufficient time to complete it
 - ◊ Clear your desk or workspace of all external materials not permitted - books, papers, other devices
 - ◊ Remain at your computer for the duration of the test
 - ◊ If the computer, Wi-Fi, or location is different than what was used previously with the "Webcam Check" and "System & Network Check" in LockDown Browser, run the checks again prior to the exam
 - ◊ To produce a good webcam video, do the following:
 - i. Avoid wearing baseball caps or hats with brims
 - ii. Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) is likely to move
 - iii. If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete
 - iv. Take the exam in a well-lit room but avoid backlighting (such as sitting with your back to a window).

d. Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted.

e. Getting Help

- Several resources are available if you encounter problems with LockDown Browser:
- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area

- As applicable, insert information about your institution's help desk, including details about how to contact them. Some help desks want students to run the "System & Network Check" and the "Webcam Check" before they are contacted - and even, to forward the results of these checks at the time of opening a ticket.
- Respondus has a Knowledge Base available from support.respondus.com. Select the "Knowledge Base" link and then select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product.
- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it.

C. Quiz and Exam Policy

1. Quizzes and Exams will be offered online using Blackboard Respondus LockDown Browser.
2. No make-up exams or quizzes will be administered.
3. If an exam or quiz is missed the grade will be 0. All grades will be used for calculating the final grade, no grades will be dropped.
4. If a student cannot attend/take a test, quiz, or final exam for a **university-acceptable excuse**, inform the instructor as soon as possible and a time will be arranged accordingly with the instructor's schedule. It is responsibility of the student to notify the instructor of any absence and to provide legitimate documentation of absence as per University regulations.

D. Attendance and Participation Policies

1. The student is expected to access Blackboard regularly (at least twice a week) for material availability, announcements, quizzes, etc.
2. The student should spend 4-6 hours a week studying the material and resources provided by the instructor (and book).
3. The student is expected and encouraged to actively participate in office hours sessions.
 - a. Multiple students may be scheduled for the same office hour session.
 - b. If it's a private matter or you wish to discuss material or have questions and prefer to have a private online office hour session, please make sure to notify the instructor when appointment is being made.

E. Etiquette guidelines

1. Treat instructor and classmates with respect.
2. Address instructor and classmates properly and accordingly.

3. Use clear and appropriate language.
4. Vulgar/obscene language, discrimination for race, color, ethnicity, gender, political or religious views, and inappropriate conduct is ***prohibited*** in class.
5. The instructor reserves the right to ban the student from the online session if vulgar language is being used if student is being disrespectful toward the instructor or classmates or exhibiting inappropriate conduct. This will be considered an absence. The student will be reported to the CLS program director.
6. Other etiquette guidelines (Netiquette) available through the following link:
 - a. https://www.utep.edu/technologysupport/Files/docs/BB_Netiquette-Guide-for-Online-Courses.pdf

F. Academic Integrity

There is a **zero-tolerance level** for academic dishonesty. Honesty and integrity are a critical aspect of your chosen profession, as well as patient confidentiality. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but it is not limited to:

1. Cheating

This means:

- a. Copying from the homework, in-class work or exam paper of another student.
- b. Engaging in written, oral, or any other means of communication with another student during an exam or homework assignment or giving aid to or seeking aid from another student during a test.
- c. Possession and/or use of test material (class notes, books, reviews, outlines, or any other material) not authorized by the instructor or exam proctor during an exam or quiz.
- d. Using, obtaining, or attempting to obtain, by any means, a part of the whole test, test key, homework solution, computer program, and tests administered during past semesters.
- e. Substituting for another person or another person substituting one's self to take a test/quiz.
- f. Falsifying data, laboratory reports and/or other records or academic work offered for credit.

2. Plagiarism

This means:

- a. The appropriation, buying, receiving as a gift, or obtaining by any means another's work, ideas, processes, results, or words without giving appropriate credit. This includes intentionally, knowingly, or carelessly, presenting the work of another as one's own; failing to credit sources

used in a work product; attempting to receive credit for work performed by another; failing to cite the World Wide Web, databases, and other electronic resources.

- b. The submission for credit of any work or material that is attributable (whole or in part) to another person (i.e., copying from another student).

3. Collusion

This means the unauthorized (secret or illegal) collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on scholastic dishonesty.

Proven violations of the detailed regulations, as printed in the *Handbook of Operating Procedures (HOP)* (available in the Office of the Dean of Students), may result in sanctions ranging from disciplinary probation, failing grades on the work in question, failing grade in the course, suspension or dismissal, among others.

G. Student Support

In case of needed assistance:

1. Helpdesk
 - a. <https://www.utep.edu/irp/technologysupport/>
2. Miner Learning Center
 - a. <https://www.utep.edu/mlc/>
3. University Library
 - a. <https://www.utep.edu/library/>

H. Accommodations

If you have a disability and need special accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, 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.

I. University Counseling Center

If you have personal issues and feel like you need assistance, the university offers counseling services and resources. They are available online and in person through the Division of Student Affairs. You can access these services:

1. Online: <https://www.utep.edu/student-affairs/counsel/index.html>
2. By phone: 915-747-5302
3. Email: caps@utep.edu
4. In Person: Counseling Center, 202 Union West, El Paso, Texas 79968

VII. Grading Policy

Evaluation Technique	%
Quizzes	15%
4 Partial Exams	15% each (60% total)
Final	25%
Total	100%

Grading Scale	Grade
90-100	A
80-89	B
75-79	C
70-74.9*	D*
69 or below*	F*
* A grade of 75 or above is required to continue in the CLS program.	