

The University of Texas at El Paso
College of Health Sciences
Clinical Laboratory Science Program
CLSC 3351 Concepts in Immunodiagnosics



Course Title: CLSC 3351 Concepts in Immunodiagnosics

Course Schedule: Summer I: June 12 – July 10, 2023
MTWRF: 9:00 – 11:20

Course Location: CHSSN 135

Instructor: M. Lorraine Torres, Ed.D, MLS (ASCP)

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Office Hours: After class or MW from 1:30 – 2:30 p.m. You may also set up a meeting via e-mail.

Course Description:

This course covers basic clinical immunology and applications in laboratory medicine. Interactions among immune cells and their secretions are examined. The role of the immune system in tumor growth, transplantation and rejection, and autoimmune diseases is covered. Various methods utilized in the clinical laboratory are demonstrated and discussed. This course includes the principles and practices of quality control and pre-analytical, analytical, and post analytical components of clinical immunology. Immunology as a science has expanded dramatically and the use of immunologic procedures are currently across disciplines. Applications of immunologic procedures are used for the detection of infectious agents, autoimmune disorders, blood grouping and compatibility, and in molecular diagnostics, to name a few areas.

Course Goal:

At the end of this course, the student will develop a strong foundation of the basic principles of immunity and the human immune system. In addition, clinical applications will be discussed including principles and practices of quality control and pre-analytical, analytical, and post analytical components of clinical immunology.

NOTE: UTEP CLS students should be aware that all CLSC courses are interrelated and you may be asked questions over material you have covered in previous CLS courses and or concurrent courses you are taking in a semester.

The Flipped or Active Laboratory / Classroom

Most of our laboratories and some lecture courses follow the “Flipped or Active Classroom” model. Students prepare for the in-person sessions by reviewing course materials and content in advance. When they arrive in class they typically have a “quiz” and may work in groups to apply their background knowledge to problem solving case studies or situations. In this model the faculty member acts as their guide and can provide instruction and corrective action as the students go through the work problems. Instead of sitting in a classroom while the instructor tells them how to do the work, the students are actually practicing the problems solving work with the faculty member’s help. Although this is often a significant adjustment for students who have not taken courses like this before, they quickly realize the value of the guided practice sessions.

Your Role in This Course

In order for you to be ready for this class (active classroom, flipped, TBL), it will be important for you to read and prepare outside of class time. Your primary knowledge and understanding of readings will be essential for success with in-class activities and assignments, many of which will take place in collaboration with your team.

In-class Team Assignments

The in-class team assignments will ask you to make specific decisions concerning specific testing related situations and problems based on the studying you did for the Study Guide. A number of those assignments may be graded. Which ones are graded will be announced during the class session

Affective Objectives

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

1. A positive attitude by being prepared for lecture completing assigned tasks on time and displaying self-motivation.
2. Organization by utilizing time effectively, sequencing and prioritizing tasks for completion with time constraints and maintaining a neat clean work.
3. Attention to detail by diligently pursuing accuracy.
4. Stability and self-confidence by approaching and performing routine tasks confidently without assistance and maintaining composure.
5. Appropriate interpersonal skills by cooperating and communicating effectively with classmates and instructors and displaying courteous, considerate behavior and appropriate appearance.
6. Ethical behavior and integrity adhering to safety policies and abiding by all rules and regulations of the institution

Cognitive Objectives

Upon completion of this course, the student should be able to:

1. Differentiate innate vs. Adaptive (acquired) immunity
2. Explain the concept of specificity and memory on the adaptive immune response
3. Explain how the field of immunology has progressed over the past century
4. Describe how physical and chemical barriers can function as an effective defense mechanism
5. Discuss the functions of the phagocytes and other cells involved in killing
6. Explain how complement enhances phagocytosis

7. List the classical signs of inflammation
8. Describe the functions of the lymphoid organs
9. Describe the process of B cell maturation
10. Illustrate the structure of an immunoglobulin
11. Discuss the rearrangement of immunoglobulin (Ig) genes and the relationship to production of Ig
12. Compare and contrast the function and structure of each Ig classes
13. Explain the role of the normal flora
14. Differentiate true pathogens from opportunistic pathogens
15. Compare and contrast the classical and alternate complement (C) pathways
16. List each of the C components
17. Define hypersensitivity
18. Differentiate between immediate and delayed hypersensitivity
19. Discuss the immunologic mechanisms underlying each type of hypersensitivity
20. Describe the RIST and RAST tests
21. Describe the principle of the following methods: precipitation, particle agglutination, immunofluorescent, EIA, direct FA,
22. Differentiate between organ specific and systemic autoimmune diseases
23. Differentiate between primary and secondary immunodeficiencies
24. Identify the genetic components of the major histocompatibility testing
25. Relate the elements in transplant rejection
26. Explain the theory of standard flow cytometric instrumentation
27. Determine the advantages and limitations of flow cytometry
28. Discuss principles and practices of quality control and pre-analytical, analytical, and post analytical components of clinical immunology.

Required Texts: These textbooks will also be used in the Serology class in the Fall semester

Miller, L.E and Stevens, C.D. (2021). Clinical immunology and Serology: A Laboratory Perspective. 5th ed. F.A., David. Philadelphia, PA.

Jarreau, P. (2015). Clinical Laboratory Science Review a bottom line approach. 6th ed. Louisiana State University Health Sciences Center Foundation. New Orleans, LA.



Here is the link to the [UTEP Bookstore](#)

The Study Guide (SG):

A tool to Help You Study for In-Class Assignments and Exams

The SG is a tool to help you focus your studying and prepare effectively and efficiently for each class session. The questions in the SG are questions you should be able to answer as a medical laboratory Scientist. The SG also serves as your preparation tool for the exams. In other words, the questions that are on the SG are directly related to the questions on the exams. The SG can also serve as your notebook (if you take notes) and review tool to prepare for the comprehensive final exam.

If you chose not to complete the SGs, you also chose not to come to class prepared which will result in

- (1) not understanding what is being discussed in class;
- (2) not being able to contribute to the in-class assignments;
- (3) being an annoyance to your team mates and the instructor because you can't contribute appropriately
- (4) not being able to help other team members understand the material better;
- (5) a negative evaluation by your team members; and importantly
- (6) you are not using this helpful tool to prepare for the exams and thus likely earn poor grades.

Technology Requirements

Course content is delivered via the Internet through the Blackboard learning management system (LMS). 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 (if forced to have class on-line). You will need to download or update the following software: Microsoft Office, **RESPONDUS**, 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. If you encounter technical difficulties of any kind, contact the [Help Desk](#). Please make sure your computer accepts Respondus and the calculator option is working.

Here is the link to the technology support center in case you are having any difficulty with technology [UTEP Technology Support Help Desk](#)

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. Accommodations are not given retroactively.*

Campus Safety and Emergencies Notifications: Information Technology at UTEP provides emergency notification via your mobile phone. Visit <http://www.utep.edu/it> for more information and registration. Check the UTEP website for health related information and updates.

Scholastic Integrity

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more: [HOOP: Student Conduct and Discipline](#).

Student Resources

UTEP provides a variety of student services and support:

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Military Student Success Center](#): UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

TIME NEEDED TO STUDY!

On average, you need to read a minimum of one chapter per day and complete the individual assignments. Look at the TENTATIVE course schedule and read the assigned chapter to be covered that day before reviewing the power points. After Reviewing the Power points, re-read the chapter while taking notes alongside your power point presentation. Come prepared to class by completing your group and or individual assignment BEFORE class. Make copies of your completed Study Guides as you will have to leave a copy of the study guide in the team folder.

Major Mistakes Students Make that Negatively Affect Their Grades:

- 1) Not asking questions when the content is not understood.
- 2) Not actively contributing to teamwork.
- 3) Being absent when in-class assignments were selected for grading.
- 4) Procrastinating, not working in advance of a deadline and missing it.

- 5) Having poor time management skills and strategies leading to not putting in the necessary work and time outside of class.
- 6) Scholastic Dishonesty

Attendance of Class Sessions: Being absent from even one class session, especially since our sessions are 2.5 hrs long, will hurt your understanding and performance in the class. You are also likely to miss graded in-class quiz / assignments that make up 10% of your grade. If you're not present you cannot get the points.

Test Policy:

All exams are taken in class and will be in an electronic format via blackboard. There will be three examinations and a comprehensive final. The lecture exams may include brief essay questions and case studies but mostly multiple choice. If you cannot log on to an exam for a legitimate reason, (death, illness etc. with documentation) inform the instructor as soon as possible and the instructor will arrange a new time. If the student does not make any arrangements (s)he will receive a ZERO on the exam. If you receive a zero you will most likely fail the course. Please notice that our grade scale is different from the standard grade scale. In order to pass the course you must earn a 75% average and a 74.9% does not constitute a passing grade. Students in the CLS program cannot continue with the program with a grade of D or below.

Organization of the Course

The course consists of three units that focus on key elements and your competencies related Immunodiagnostics. Specific dates for the Study Guides and reading assignments can be found in the Tentative Course Schedule and will be posted on Blackboard—check the course site regularly and **watch for emails from the instructor on your UTEP email account.** Pay careful attention to which Study Guides are associated with which class sessions. Units are subject to change thus make sure you are keeping up with blackboard and are aware of changes.

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|--------|--|
| Unit 1 | Nature of the Immune System |
| Unit 2 | Basic Immunologic Procedures – specifics will be in Serology class |
| Unit 3 | Immune Disorders |

Grade Scale:

- | | |
|------------|-----|
| 90 – 100 | = A |
| 80 – 89 | = B |
| 75 – 79 | = C |
| 74.9 – 70 | = D |
| 69 & below | = F |

This is the **“Ticket to Class”** You will need one on scheduled days to enter the classroom. **You will not be allowed to enter the class without a ticket unless you have a “free” day.** The tickets are posted on Blackboard / Announcements and you are responsible for downloading them and completing the assignment.



HOW DO YOU EARN YOUR GRADE?

Your grade will consist of four parts. The percentages shown for each item will be multiplied by the scores you earn.

60%	3 exams (each 20%)
13%	Assignments and tickets to class (average of all grades)
7%	Term paper
20%	comprehensive final

All exams will require the use of Respondus lock down. You will need a computer with webcam. If you do not have a webcam you will need to get one before the first exam. You will not be allowed to take the test without the webcam. Phones may not be used as a calculator. A calculator option will be enabled to your exam and you may use your keyboard as a calculator. With this in mind, make sure you have a full keyboard that include numbers. Scientific and programmable calculators are not to be used in the CLS Program. Make sure you have your computer checked so that the calculator function in Respondus works on your computer

Some hints on how to succeed in this course (and probably in other courses also)

It is essential to develop good time management and study skills in order to succeed in any course you take. Good study skills not only save you time and energy, but also help you learn more effectively. Four study skills that will promote your learning are:

- Self-management
- Making useful notes
- Reading to learn
- Studying with others – if that is your learning style

Self-management techniques

“If you don’t know where you’re going you could wind up someplace else” Yogi Berra

It is critical that you will manage your time wisely. Organize yourself by planning a schedule. In this schedule, you may want to record time for reading, reviewing and studying for tests. Adjust your schedule as the course progresses. Use a study location free of distractions and review periodically.

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.

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.

Study with others

Study groups are one of the best ways of learning. Review the subject, formulate questions and discuss main ideas. Test each other for knowledge. Explain what you have learned to others. If you can explain clearly the material, you have learned then you can be sure you know your material well.

Tentative Schedule: Subject to Change

Note: Chapters not specifically covered in this course will be covered in CLSC 3260/3161 (Serology and Lab), CLSC 4210/4111 (Molecular Diagnostics and Lab) and CLSC 3354/3365 Chemistry I/II. The chapters covered in above-mentioned classes are chapters 8, 11, 12, and 17. In chapter 10, I will only be discussing part of the chapter (affinity, avidity, and precipitation curve).

Exams will be on Monday's unless a holiday is on a Monday.

Class Dates	Unit Topic	Study Guide / Reading Assignment
Unit 1	Nature of the Immune System	
June 12	Intro – blood cells and organs of immune system	Creation of teams, The syllabus (In class syllabus reconnaissance) and Chapter 1. Give iRat and tRat as example. Team activity
June 13	Innate Immunity	Chapter 2
June 14	Antigens and MHC	Chapter 3
June 15	Adaptive immunity	Chapter 4
June 16	Antibody structure	Chapter 5 iRAT and tRAT
June 19	NO CLASS	
June 20	EXAM 1	Exam over chapters 1- 4
June 21	Cytokines	Chapter 6
June 22	Complement	Chapter 7 iRAT and tRAT
June 23	Blood preparation and dilutions	Chapter 9 possible start chapter 10 (selected topics – avidity and affinity, prozone)
Unit 2	Basic Immunologic Procedures	
June 26	EXAM 2	Exam over chapters 5, 6, 7, (comprehensive chapters 1 – 4)
June 27	Antigen-Antibody Binding	chapter 10
June 28	Flow Cytometry	Chapter 13 iRAT and tRAT
Unit 3	Immune Disorders	
June 29	Hypersensitivity	Chapter 14
June 30	Autoimmunity	Chapter 15
July 3	Exam 3	Chapters 9 -15 (comprehensive chap. 1 – 15)
July 4	NO CLASS (will do a self-study)	Chapter 16 Transplant immunology (HLA)
July 5	Tumor Immunology (selected topics)	Chapter 17 may start 18

July 6	Immunoproliferative Diseases	Chapter 18 (very important for Hematology II) iRAT and tRAT
July 7	Immunodeficiency Diseases	Chapter 19
July 10	Final Exam	will be comprehensive but will focus more on chapters 16 – 19

This is the rubric I will use to grade your research paper
Immunodiagnosics: Grading Paper Rubric

Name _____ Points __your points _____ /_total 45 points__= % _____

	Times new Roman 12 font yes (1) /no (0)	Left justified yes (1) /no (0)	One inch margins yes (1) /no (0)	Page numbers yes (1) /no (0)	Minimum 1 figure or table yes (1) /no (0)	
Plagiarism check	Less than 15% I will read the paper no deductions	16 – 20% I will read the paper and take off 10 points	Greater than 20% I will not read the paper and will send the paper forward to OSCAR for Plagiarism and student will get zero for the assignment.			
Category	Exceeds standards 5 points	Meets standards 4 points	Nearly meets standard 3 points	Does not meet standard 2 points	No evidence 1 points	score
Clarity of topic (Thesis)	Clearly and concisely states the paper's purpose in a single sentence, which is engaging, and thought provoking.	Clearly states the paper's purpose in a single sentence	States the paper's purpose in a single sentence.	Incomplete or unfounded You begin with the introduction to Covid	Absent or no evidence	
Introduction	The introduction is engaging, states the main topic and previews the	The introduction states the main topic and previews the structure of the paper.	The introduction states the main topic but does not adequately preview the	There is no clear introduction or main topic and the structure of	Absent, no evidence	

	structure of the paper		structure of the paper.	the paper is missing		
Body	Each paragraph has thoughtful supporting detail sentences that develop the main idea.	Each paragraph has sufficient supporting detail sentences that develop the main idea.	Each paragraph lacks supporting detail sentences.	Each paragraph fails to develop the main idea.	Not applicable	
Organization-Structural Development of the Idea	Writer demonstrates logical and subtle sequencing of ideas through well-developed paragraphs; transitions are used to enhance organization.	Paragraph development present but not perfected.	Logical organization; organization of ideas not fully developed.	No evidence of structure or organization.	Not applicable	
Conclusion	The conclusion is engaging and restates the thesis.-	The conclusion restates the thesis- Conclusion given but did not restate the thesis as no thesis was given.	The conclusion does not adequately restate the thesis	Incomplete and/or unfocused	Absent	
Mechanics	No errors in punctuation, capitalization and spelling	Almost no errors in punctuation, capitalization and spelling	Many errors in punctuation, capitalization and spelling	Numerous and distracting errors in punctuation, capitalization and spelling	Not applicable	
Citations	All cited works, both text and References, done in the correct format with no errors.	Some cited works, both text and visual, are done in the correct format. Inconsistencies evident.	Few to no cited works in text, but in references; are done in the correct format. Zuo & Dance yes	Absent You mentioned studies from the University of Georgia but there are no citations	Not Applicable	