

UTEP

Clinical Laboratory Science



CLSC 3252

Restricted for CLSCUD majors only

BODY FLUIDS

Course Outline

Body fluids are liquids originating from inside the bodies of living humans. They include fluids that are excreted or secreted from the body. Human body fluids are utilized as sources for clinical markers for diagnosis and prognosis of disease.

INSTRUCTOR

M. Lorraine Torres, Ed.D, MT (ASCP)

College of Health Sciences, Room 423

747-7282

Office hours: Monday and Wednesday 3-4 pm Friday 1:00 – 2:00 or by appointment

lorit@utep.edu

CLASS LOCATION

MW 11:00 – 11:50: College of Health Sciences 135

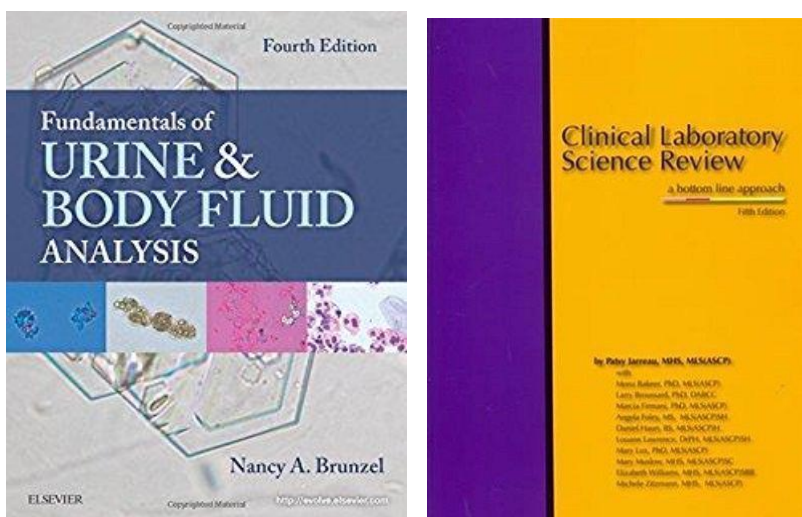
COURSE DESCRIPTION

The Body Fluids course is designed to provide a basic understanding of the prime mechanisms involved in urine and other body fluid formation, function and examination. This course will prepare the student to correlate data with his/her knowledge of basic anatomy and physiology in order to understand pathologic processes. This course will present the fundamental principles of urine and other body fluid analysis/evaluation including chemical and microscopic procedures. This course will provide the student with the knowledge to accurately identify normal and abnormal components of urine and other body fluids. A body fluids laboratory will be incorporated within the course.

REQUIRED TEXTBOOKS:

Brunzel, Nancy A. 2018. *Fundamentals of Urine and Body Fluid Analysis* (4th ed.). Elsevier. St. Louis, MO.

Jarreau, P. 2015. *Clinical Laboratory Science Review a Bottom Line Approach* (5thed.). Louisiana State University Health sciences Center foundation. New Orleans.

**COURSE GOAL:**

This course is designed to provide basic theory and entry level laboratory experience in the analysis of urine and other body fluids. The student will learn to competently perform basic procedures and correctly interpret the findings given adequate clinical data. This course will provide the student with the knowledge to accurately distinguish between normal and abnormal physical, chemical, and microscopic components of the analysis of urine and identify various testing procedures to evaluate the patient results in light of clinical evidence.

COGNITIVE COURSE OBJECTIVES

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

1. Identify the functions of the various components of the microscope. Describe Kohler illumination and the microscope adjustment procedure used to ensure optimal specimen imaging. Level I
2. Describe the relationship of OSHA to safety in the workplace. Level I
3. Describe universal precautions policy and its purpose Level I
4. Describe appropriate procedures for the handling, disposal, decontamination and spill control of biohazards. Level I
5. State the purpose of and information contained in a material safety data sheet. Level I
6. State clinical reasons for performing routine urinalysis. Level I
7. Define and discuss the importance of the following: critical values, documentation, ethical behavior, technical competence, test utilization, turn around time Level II

8. Identify and explain preanalytical, analytical and postanalytical components of quality assurance Level II
9. Differentiate quality control vs. quality assurance Level I
10. Explain the various collection techniques employed to obtain an assortment of specimens and the importance of accurate timing and complete collection of urine specimens. Level I
11. State the changes possible in unpreserved urine and explain the mechanism for each. Level II
12. Diagram the structure and explain the function of the urinary system Level II
13. Diagram and state the function of each portion of the nephron. Level II
14. Discuss the components and the process of glomerular filtration and urine formation, including the anatomic structures, filtration forces, and substances involved. Level II
15. Describe the transport mechanisms of the tubular reabsorption and tubular secretion, including the substances involved Level II
16. State the volume and the solute composition of normal urine. Level I
17. Differentiate between the solute amount (osmolality) and the solute mass (specific gravity) in urine and describe ways in which they are measured. Level II
18. List appropriate color terms and the substances that can produce the colors, and identify those substances that indicate a pathologic process Level I
19. Discuss the origins of urine pigments and their effects on urine color Level I
20. Describe and evaluate the physical, chemical and microscopic characteristics of urine and correlate them to disease states. Level II
21. Discuss the pathogenesis of glomerular damage and describe morphological changes that occur in the glomeruli. Level II
22. Describe the physiologic mechanism, clinical features and the urinalysis laboratory diagnosis of metabolic disorders (amino acid disorders). Level II
23. Describe the microscopic staining techniques used to enhance visualization of the formed elements in urinary sediment Level I
24. Describe the formation, composition and clinical significance of urinary cast formation Level II
25. Identify the following formed elements found in urine sediment and discuss their clinical significance: bacteria, clue cells, fecal contaminants, fibers, hemosiderin, parasites, spermatozoa, starch, Trichomonads, Yeast. Level II
26. State the primary purpose of fecal analysis LI
27. Classify the condition of diarrhea according to the physiologic mechanisms involved LII
28. Identify at least 3 causes of decretory and osmotic diarrhea
29. Compare and contrast the mechanisms of maldigestion and malabsorption in relation to diarrhea LII
30. Differentiate steatorrhea from diarrhea and discuss the physiologic conditions that result in steatorrhea. LI
31. Describe the chemical principle for screening feces for hemoglobin LI
32. State 2 methods for qualitative detection of abnormal amounts of fecal carbohydrates LI
33. Discuss the composition of seminal fluid LI

34. Summarize the collection of seminal fluid for analysis including timing and recovery of the complete specimen LI
35. Identify the morphology and the normal counts of spermatozoa LI
36. Discuss the role of quantifying the following biochemical substances in seminal fluid: acid phosphatase, citric acid, fructose, pH, Zinc.
37. Discuss the assessment of the secretory function of the prostate gland LI
38. Discuss amniotic fluid formation and interaction with the fetus LII
39. State four indications for performing amniocentesis and the stage in pregnancy best suited for analysis LI
40. Differentiate amniotic fluid from urine LI
41. Compare and contrast the following testes for fetal pulmonary maturity: lecithin-sphingomyelin, phosphatidylglycerol, foam stability, fluorescence polarization
42. Associate physical appearance of amniotic fluid in health and disease states
43. Describe the formation of CSF and 3 functions LI
44. Discuss the appropriate collection of CSF and State the physical characteristics of CSF and how these can be modified in disease LI
45. Discuss the clinical importance of the microscopic examination of CSF LI
46. Explain the clinical significance of the presence of the following: Albumin, glucose, IgG, Lactate, total protein in health and in disease LII
47. State the physical and chemical characteristics of normal synovial fluid LI
48. Correlate the cells, crystals observed during microscopic examination LII
49. Compare and contrast selected chemical constituents of synovial fluid
50. Discuss the microbiology of synovial fluid infections. Which organisms are the most commonly seen in septic arthritis
51. Describe the pathologic changes that lead to effusion formation LI
52. Discuss the collection of serous fluids LI
53. Classify a serous fluid effusion as transudate or exudate based on chemical, physical and microscopic analysis LII
54. Describe the function of serous membranes and the formation of serous fluids LI
55. Compare and contrast chylous and pseudo-chylous effusions
56. Discuss the collection and handling of vaginal secretions LI
57. Discuss vaginal secretions results associated with health, including pH, and microscopic entities
58. Differentiate clue cells from squamous epithelial cells
59. Discuss the clinical significance of the following tests performed in vaginal specimens: wet mounts, KOH, amine test LI
60. Compare and contrast the causes, clinical features and treatments for vaginosis, candidiasis, trichomoniasis
61. Integrate the knowledge gained during the course to solve and evaluate clinical cases given the appropriate data. Brief cases will be given in every section
Level III

NOTE: Each chapter of the book has written objectives. The student should answer these objectives in order to understand the material fully.

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 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 and maintaining a neat clean work.
3. Attention to detail by diligently pursuing accuracy and documenting data accurately and legibly.
4. Problem solving ability by explaining 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.

PSYCHOMOTOR OBJECTIVES

Refer to the Body Fluids Laboratory syllabus.

CLASS ATTENDANCE

The student is expected to attend all classes. It is the responsibility of the student to notify the instructor of any absence. In the case of an emergency or illness, the instructor should be notified as soon as possible. When, however, **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. The student will be dropped if they miss 4 or more classes.** If a student is 10 minutes late this will be recorded as a tardy. Two tardies make one absence.

TEST POLICY:

There will be four examinations and a comprehensive final. The lecture exams may include brief essay questions and case studies along with multiple choice questions. **No make-up exams will be offered.** If you cannot attend an exam for a legitimate reason, (death, illness etc.) 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. **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.

EXAMINATIONS:

Four exams and a **comprehensive final** will be given. Exams are worth 40% of the total grade and the final is worth 40%. **No makeup exams will be given.** If an exam is missed (0%) the final grade will be based on the average of 4 exams. **None of the test grades will be dropped. You must attend all classes. On a day that an exam is given in another class if you do not attend the Body Fluids class 5 points will be taken off your next Body Fluids exam.**

GRADING SCALE:

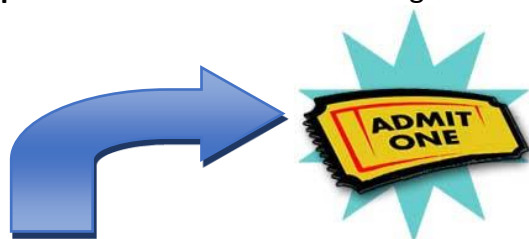
A 100 - 90%
 B 89 - 80%
 C 79 - 75 %
 D 74.9 – 70%
 F 69 or below

FINAL GRADE CALCULATION:

Exams	40%
Quizzes/ homework	20%
Final	40%

UNANNOUNCED QUIZZES AND ASSIGNMENTS:

Tickets to Class and unannounced quizzes will be given throughout the course and will constitute 20% of the final grade. There are no make-up exams or quizzes. **Late assignments will not be accepted** and student will receive a grade of zero (0%) for that assignment.



This is the "Ticket to Class" You will need one each time class meets. You will not be allowed to enter the class without a ticket unless you have a "free" day. The tickets are posted on Blackboard and you are responsible for downloading them and completing the assignment

UNIVERSITY / CLS POLICY ON EXAMINATIONS:

When examinations are administered, students are to place backpack, papers and other personal belongings at the front or side of the room. Students will spread around the room when seating themselves. The Instructor may move you if (s)he sees a need. No hats, caps, or bulky clothing may be worn. Phones may not be used as calculator. Programmable calculators

are not to be used in the CLS Program, only basic calculators will be allowed. **Students will return examination papers in to the exam monitor before leaving the room for any reason; once a student has left the room, he/she may not continue with the examination.** If a student misses an exam or a quiz, a make-up exam may be taken **ONLY IF** the student has informed the instructor of the absence prior to the beginning of the examination, and only if the absence is approved by the instructor, only in rare instances will a student be excused from an examination or a quiz. If permission is given to take an exam or a quiz, it will be scheduled at the convenience of the instructor. 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.

MAKE UP EXAMS/QUIZZES (WITH INSTRUCTOR'S APPROVAL)

Make up exams/quizzes will have an **automatic deduction of 7 points.** Make ups 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.

INSTRUCTIONAL STRATEGIES:

In order to succeed in this class the student will need to begin with the "Key Terms" provided in the beginning of each chapter of your textbook. Make sure you can define these key terms. Make sure you are reading you chapters at least twice. There will be a quiz and or a ticket to class at the beginning of almost every class. **Each chapter of the book has written objectives. The student should answer these objectives in order to understand the material fully.** At the end of the chapters there are review questions and case studies. The student should answer these review questions and case studies in order to assess the student's grasp of the chapter content.

TIME NEEDED TO STUDY!

For each hour you spend in class, you should spend 2-3 hours outside of class studying. Thursday is your study day and differential day that you should be using to help you progress in the CLS curriculum.

STUDENTS WITH DISABILITIES

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. **Accommodations are not given in retrospect.**

CELL PHONES/LAP-TOPS:

All cell phones must be **OFF or IN SILENCE MODE.** Computers are allowed just for materials related to class. If a student is caught surfing the web or other unrelated subject/materials, he/she won't be allowed to bring his/her computer to class again.

ACADEMIC DISHONESTY:

There is a zero tolerance level for academic dishonesty. Absolute honesty and integrity are a critical aspect of your chosen profession. Any student suspected of academic dishonesty may be subject to disciplinary action, including the possibility of failure of the course and dismissal from the university. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act to give unfair advantage to student or the attempt to commit such acts." Regent's Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22. Since scholastic dishonesty harms the individual, all students, and the integrity of the university, policies on scholastic dishonesty will be strictly enforced.

Examples of "cheating" include (but not limited to):

- Copying from the homework, in-class work or exam paper of another student, 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;
- Possession and/or use during an exam or home test of materials which are not authorized by the person giving the test, such as class notes, books, or specifically designed "crib notes";
- Using, obtaining, or attempting to obtain by any means the whole or any part of non-administered test, test key, homework solution, or computer program; using a test that has been administered in prior classes or semesters but which will be used again either in whole or in part without permission of the instructor; or accessing a test bank without instructor permission;
- Collaborating with or seeking aid from another student for an assignment without authority;
- Substituting for another person, or permitting another person to substitute for one's self, to take a test;
- Falsifying research data, laboratory reports, and/or other records or academic work offered for credit.

"Plagiarism" means the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own academic work offered for credit, or using work in a paper or assignment for which the student had received credit in another course without direct permission of all involved instructors.

NOTE: This includes cutting-and-pasting and photocopying from on-line and other material.

"Collusion" means the unauthorized 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.

BODY FLUIDS TENTATIVE COURSE SCHEDULE

DATE	Topic to be covered
Aug 27	Microscopy Chapter 18
Aug 29	QA/safety Chapter 1
Sep 3	Labor Day NO CLASS
Sept 5	Urine specimen types, collection, and preservation Chapter 2
Sept 10	The Kidney Chapter 3
Sept 12	The Kidney Chapter 3
Sept 17	The kidney / Renal function Chapter 3 - 4
Sept 19	Renal function Chapter 4
Sept 24	Renal Function Chapter 4
Sept 26	Exam 1 (Chapter 1 – 4, 18)
Oct 1	Physical exam of urine Chapter 5
Oct 3	Chemical Exam of urine Chapter 6
Oct 8	Chemical Exam of urine Chapter 6
Oct 10	Chemical Exam of urine Chapter 6
Oct 15	EXAM 2 (chapters 5 – 6)
Oct 17	Microscopic exam of urine Chapter 7 – HOPE FAIR
Oct 22	Microscopic exam of urine Chapter 7
Oct 24	Microscopic exam of urine Chapter 7
Oct 29	Metabolic Diseases Chapter 8
Oct 31	Metabolic Diseases Chapter 8
Nov 5	Metabolic Diseases Chapter 8
Nov 7	Cerebrospinal Fluid chapter 9
Nov 12	EXAM 3 (chapters 7 – 8)
Nov 14	Pleural, Pericardial, Peritoneal Fluid analysis chapter 10
Nov 19	Synovial Fluid Analysis Chapter 11
Nov 21	Seminal Fluid Analysis Chapter 12
Nov 26	Exam 4 (chapters 9 – 12)
Nov 28	Vaginal Secretions Chapter 13
Dec 3	Amniotic Fluid Analysis Chapter 14
Dec 5	Fecal Analysis Chapter 15
DEC 11	Comprehensive final 9-12 Room TBD

Student Due Process: Students who believe they have been unfairly evaluated must:

Step 1: Attempt to resolve the difficulty with the faculty member.

Step 2: If the dispute cannot be resolved in Step 1, the student may within 5 school days appeal to the program director stating the evidence for the continued dispute in writing.

Step 3: If still unresolved a written complainant, evidence, and reason for the dissatisfaction must be submitted to the Assistant Dean of the College of Health Sciences. The Assistant Dean will call upon the Due Process Committee to review and make recommendations to the Assistant Dean based on statements, written evidence, and interviews with all parties involved.

Step 4: If the matter is still not settled, the complainant will notify the Dean, within five (5) school days. The Dean will then pursue the matter with the Vice President for Student Affairs

The process will continue until the matter is resolved.