Ohio Articulation Number (OAN)
Course Submission Form
2005-2006

College/University: Youngstown State University

Course(s) Submitted (Title & Course #): CLTEC 1502/1502L Urinalysis & Body Fluids

Ohio Articulation Number: OHL010

Date: 5-16-06
Course: Urinalysis & Body Fluids Course

Name and title of individual submitting on behalf of the college/university:
Name: Maria Delost
Title: Professor & Director of Clinical Laboratory Programs

Address: Dept of Health Professions
1 University Plaza,
Youngstown, O 44555

E-mail: medelost@ysu.edu
Phone: 330-941-1761
Fax: 330-941-2921

Credit Hours: 3 qtr
Lecture Hours: 2
Laboratory Hours: 1 (if applicable)
Placement Score: (Name of test) (Domain) (Score)

Catalog/Course Description (Includes Course Title and Course #):
CLTEC 1502/1502L: Urinalysis & Body Fluids Lecture & Lab

Texts/Outside Readings/Ancillary Materials
Course Objectives and/or Plan of Work

Youngstown State University
CLTEC 1502/1502L: Urinalysis & Body Fluids
Objectives

*Denotes laboratory objective

**Urinalysis**

I. FUNCTION AND DISEASES OF THE KIDNEY

Instructional Objectives
Upon completion of this section, students will be able to:

1. Discuss the physiological mechanisms of glomerular filtration, tubular reabsorption, tubular secretion, and renal blood flow.
2. Identify the laboratory procedures used to evaluate the above four renal functions.
3. Explain why creatinine is the substance of choice for testing glomerular filtration rates.
4. Given hypothetical laboratory data, calculate a creatinine clearance and determine if results are normal.
5. Describe the Fishberg and Mosenthal concentration tests, including specimen collection, testing, and normal results.
6. Define osmolarity and discuss its relationship to urine concentration.
7. Describe the basic principles of clinical osmometers.
8. Given hypothetical laboratory data, calculate a free water clearance and interpret the result.
9. Discuss the PSP test with regard to specimen collection, chemical testing, and physiological principle.
10. Given hypothetical laboratory data, calculate a PAH clearance and relate this result to renal blood flow.
11. Describe the relationship of ammonia to urinary titratable acidity and to the production of acidic urine.
12. State the primary cause of acute glomerulonephritis and describe the major urinalysis findings.
13. Briefly discuss the chronic forms of glomerular disease, the nephritic syndrome, and renal failure, including the renal functions affected and significant urinalysis results.
14. Describe the urine sediment in pyelonephritis.

II. INTRODUCTION TO URINALYSIS

Instructional Objectives
Upon completion of this section, students will be able to:
1. List three major chemical constituents of urine.

2. Describe a method for determining that a questionable fluid is urine.

3. List three basic rules for specimen handling and explain their importance.

4. Briefly discuss five methods for preserving urine specimens, including their advantages and disadvantages.

5. List eight changes that may take place in a urine specimen that remains at room temperature for more than 2 hours.

6. Instruct a patient in the correct procedure for collecting a timed urine specimen.

7. Describe the type of specimen needed to obtain optimal results when a specific urinalysis procedure is required.

8. Define the common terms encountered in urinalysis and use them in proper context.

9. State the common abbreviations associated with urinalysis and tell what they represent.

*10. Correctly store and process urine specimens and other body fluids according to laboratory policy. Correlate the effects of inappropriate storage on urinalysis results.

III. PHYSICAL EXAMINATION OF THE URINE

Instructional Objectives
Upon completion of this section, students will be able to:

1. Relate the common terminology used to report normal urine color.

2. Discuss the relationship of urochrome to normal urine color.

3. Explain how the presence of bilirubin in a specimen may be suspected.

4. Explain the significance of cloudy red urine and clear red urine.

5. Name two possible causes of black or brown urine.

6. Discuss the significance of Pyridium in a specimen.

7. Relate appearance to possible physiological states.

8. List the common terminology used to report appearance.
9. Describe the appearance and discuss the significance of amorphous phosphates and amorphous urates in freshly voided urine.

10. List three pathologic and four nonpathologic causes of cloudy urine.

11. Define specific gravity and tell why this measurement is valuable in the routine analysis.

12. Describe the principles of physics used in measuring specific gravity by urinometer and refractometer.

13. Given the calibration temperature and specimen temperature, calculate a temperature correction for a specific gravity reading determined by urinometer.

14. Given the concentration of glucose and protein in a specimen, calculate the correction needed to compensate for these high molecular weight substances in the urinometer specific gravity reading.

15. Name two nonpathogenic causes of abnormally high specific gravity readings.

*16. When given a urine sample, identify the color and physical appearance.

*17. Perform a urine specific gravity without error and classify result as within or not within the reference range.

*18. Correlate urine color and appearance with specific gravity.

*19. Maintain a clean, safe and appropriate laboratory environment. Adhere to all laboratory safety guidelines related to biohazards, chemical hazards and sharps.

IV. CHEMICAL EXAMINATION OF THE URINE

Instruction Objectives

Upon completion of this section, students will be able to:

1. Describe the proper technique for performing chemical tests on urine by dipstick and give possible errors if this technique is not followed.

2. List four causes of premature deterioration of dipsticks and tell how to avoid them.

3. List five quality control procedures routinely performed with dipstick testing.

*4. Perform and interpret quality control on urine controls with the instructor’s assistance. Identify quality assurance procedures associated with the urinalysis laboratory and discuss the significance of each.
5. Name two reasons for measuring urinary pH and discuss their clinical applications.

6. Discuss the principle of pH testing by dipstick.

*7. Perform and interpret the urine pH without error on samples provided. Record all results accurately.

8. Describe three renal causes of proteinuria and two nonrenal reasons for proteinuria.

9. Explain the “protein error of indicators” and list sources of interference that may occur with this method of protein testing.

10. Name two confirmatory tests for urine protein performed in the urinalysis laboratory and name any sources of error associated with these procedures.

11. Describe the unique solubility characteristics of Bence Jones protein and tell how they can be used to perform a screening test for the presence of this protein.

*12. Perform and interpret the protein test without error on the samples provided. Record all results accurately.

13. Explain why glucose that is normally reabsorbed in the proximal convoluted tubule may appear in the urine.

14. State the renal threshold levels for glucose.

15. Describe the principle of the glucose oxidase method of dipstick testing for glucose and name possible causes of interference with this method.

16. Describe the copper reduction method for urinary carbohydrate testing and list possible causes of interference.

17. Contrast the advantages and disadvantages of the glucose oxidase and copper reduction methods of glucose testing.

*18. Perform and interpret the glucose oxidase technique on the samples provided without error. Record all results accurately.

*19. Perform and interpret the Benedict’s test on the samples provided without error. Record all results accurately.

20. Name three reasons for the appearance of ketonuria.
21. List the three “ketone bodies” appearing in urine and describe their measurement by the sodium nitroprusside reaction and possible causes and interference.

*22. Analyze urine for the presence of ketones using the multistix and Acetest without error. Interpret and record all results accurately.

23. Differentiate between hematuria and hemoglobinuria and explain the clinical significance.

*24. Analyze urine for the presence of hemoglobin without error. Interpret and record all results accurately.

25. Evaluate the principles of each biochemical reaction of the chemical strip with regard to sensitivity, chemical reaction, specificity, and possible sources of error.

V. SPECIAL URINALYSIS SCREENING TESTS

Instructional Objectives
Upon completion of this section, students will be able to:

1. Explain the abnormal accumulation of metabolites in the urine in terms of overflow and renal disorders.

2. Name the metabolic defect in phenylketonuria and describe the clinical manifestations it produces.

3. Discuss the performances of the Guthrie and ferric chloride tests and their roles in the detection and management of phenylketonuria.

4. List two tests used to screen for urinary tyrosine and its metabolites.

5. Name the abnormal urinary substance present in alkaptonuria and tell how its presence may be suspected.

6. Describe the appearance of urine containing excess melanin and two screening tests to detect its presence.

7. Describe a basic laboratory observation that has relevance in maple syrup urine disease.

8. Differentiate between the presence of urinary indican due to intestinal disorders and Hartnup disease.

9. State the significance of increased urinary 5-HIAA.

10. Discuss the instructions that must be given to patients prior to the collection of
samples to be tested for 5-HIAA.

11. Differentiate between cystinuria and cystinosis, including the differences that will be found during analysis of the urine.

12. Name the chemical screening test for cystine.

13. Explain the chemical screening test for cystine.

14. Describe the basic pathway for the production of heme and tell the two stages affected by lead poisoning.

15. Describe the appearance or urine that contains increased porphyrins.

16. Name the porphyrins measured by the Ehrlich reaction and those detected by fluorescence under a Wood’s lamp.

17. Describe the chemical principle of the dipstick method for blood testing and list possible causes of interference.

18. Discuss the presence of myoglobin and its role in the chemical testing for urinary blood.

19. Describe the degradation of hemoglobin to bilirubin, urobilinogen, and finally urobilin.

20. Differentiate between conjugated and unconjugated bilirubin, including their relationship to urinary excretion of bilirubin.

21. Describe the relationship of urinary bilirubin and urobilinogen to the diagnosis of bile duct obstruction, liver disease, and hemolytic disorders.

22. Name the earliest test to detect urinary bilirubin.

23. Discuss the principle of oxidation tests and diazotization tests for urinary bilirubin, including possible sources of error.

24. Relate the advantage of performing an ictotest for detection of urine bilirubin.

25. Name two technical errors that may produce false-negative bilirubin reactions.

26. Give two reasons for increased urine urobilinogen and one reason for an absence of urine urobilinogen.

27. Name the chemical contained in Ehrlich’s reagent.
28. Accurately perform the tests to detect bilirubin and urobilinogen in urine. Interpret and record all results accurately. Correlate elevated bilirubin and urobilinogen with disease states.

29. Give the proper method for collecting and preserving specimens to be tested for urine urobilinogen.

30. Describe the Watson-Schwartz test used to differentiate among urobilinogen, porphobilinogen, and Ehrlich-reactive compounds.

31. Discuss the principle of the nitrite dipstick test for bacteriuria.

32. List three possible causes of a false-negative result in the dipstick test for nitrite.

33. Compare dipstick testing for urine specific gravity with urinometer and refractometer testing.

34. State the principle of the chemical dipstick test for leukocytes.

35. Discuss the advantages and disadvantages of the dipstick test for leukocytes.

36. Accurately identify the presence of leukocytes and nitrite in a urine specimen. Interpret and record all results correctly.

37. Perform a complete physical and chemical urinalysis on specimens provided. Interpret and record all results accurately and identify sources of error.

VI. MICROSCOPIC EXAMINATION OF THE URINE

INSTRUCTIONAL OBJECTIVES
Upon completion of this section, students will be able to:

1. List eight formed elements found in urinary sediments.

2. Discuss the methods used by commercial systems standardize the microscopic examination.

3. Name the four elements in the Addis count and recognize their normal values.

4. Describe the eight standard steps for performing the microscopic urinalysis.

5. Distinguish between relative centrifugal force and revolutions per minute.

6. Correlate physical and chemical urinalysis results with microscopic observations.

7. Name the dyes used in the Sternheimer-Malbin and Sternheimer stains.
8. Describe, “glitter cell” and discuss their origin


10. List the normal values for red blood cells and hyaline casts

11. Discuss the significance of red blood cells in the urinary sediment

12. Differentiate among red blood cells, yeast, and oil droplets

13. Discuss the significance of whit blood cells in the urinary sediment.

14. Name, describe, and give the origin of the three types of epithelial cells found in the urinary sediment

15. Differentiate between leukocytes and renal tubular epithelial cells

16. Discuss the significance of oval fat bodies

17. List four conditions necessary for urinary cast formation

18. Name the major protein found in casts

19. Discuss the significance of hyaline, red blood cell, white blood cell, epithelial cell, granular, waxy, and fatty casts.

20. Discuss the significance of crystals in the urine, to include calcium oxalate, triple phosphate and uric acid.

21. Differentiate those crystals found in acid urine from those found in alkaline urine.

*20. Describe and identify the following from urine sediment and correlate with the physical and chemical examination of urine, when appropriate.
   a. Red blood cells
   b. White blood cells
   c. Epithelial cells
   d. Hyaline, granular, waxy and cellular casts
   e. Crystals (calcium oxalate, triple phosphate, uric acid).

*21. Perform a microscopic examination on a urine specimen. Results must correlate with the known values. Relate the findings to specific pathological states when appropriate.
Cerebrospinal Fluid
Learning Objectives

Upon completion of this unit, the student will:

1. State the three major functions of cerebrospinal fluid (CSF).
2. Distribute CSF specimen tubes numbered 1, 2, and 3 to their appropriate laboratory sections and correctly preserve them.
3. Describe the appearance of normal CSF.
4. Define xanthochromia and state its significance.
5. Differentiate between CSF specimens caused by intracranial hemorrhage and a traumatic tap.
6. Calculate CSF total, white blood cell and red blood cell counts when given the number of cells seen, amount of specimen dilution, and the squares counted in the Neubauer chamber.
7. Briefly explain the methods used to correct for WBCs and protein that are artificially introduced during a traumatic tap.
8. Describe the leukocyte content of the CSF in bacterial, viral, tubercular, and fungal meningitis.
9. Describe and give the significance of abnormal macrophages in the CSF.
10. Differentiate between the appearance of normal choroidal cells and malignant cells.
11. State the normal value for CSF total protein.
12. List three pathologic conditions that produce an elevated CSF protein.
13. Discuss the basic principles, advantages, and disadvantages of the turbidimetric and the dye-binding methods of CSF protein analysis.
14. Determine whether increased CSF immunoglobulin is the result of damage to the blood-brain barrier or central nervous system production.
15. Discuss the significance of CSF electrophoresis findings in multiple sclerosis and the identification of CSF.
16. State the normal CSF glucose value.
17. Name the possible pathologic significance of a decreased CSF glucose.
18. Briefly discuss the diagnostic value of CSF lactate and glutamine determinations.
19. Name the microorganism associated with a positive India Ink preparation.
20. Briefly discuss the diagnostic value of the bacterial cryptococcal antigen tests.
21. State the diagnostic value of the limulus lysate test.
22. Determine whether a suspected case of meningitis is most probably of bacterial, viral, fungal, or tubercular origin, when presented with pertinent laboratory data.
23. Describe the role of the Veneral Disease Research Laboratories test and fluorescent treponemal antibody-absorption test for syphilis in CSF testing.
24. Describe quality control procedures and safety precautions related to CSF procedures.
25. When given a simulated spinal fluid, correctly
   a. State the color and appearance.
   b. Perform a chamber count for white blood cells.
   c. Differentiate neutrophils from lymphocytes if appropriate
   d. Perform and interpret a glucose and total protein analysis, if appropriate
**Semen**

Learning Objectives

Upon completion of this unit, the student will:

1. Describe the four components of semen with regard to source and function.
2. Describe the normal appearance of semen and three abnormalities in appearance.
3. State two possible causes of low semen volume.
4. Discuss the significance of semen liquefaction and viscosity.
5. Calculate a sperm concentration and count when provided with the number of sperm counted, the dilution, the area of the counting chamber used, and the ejaculate volume.
6. Define round cells, and explain their significance.
7. State the two parameters considered when evaluating sperm motility.
8. Describe the appearance of normal sperm, including structures and their function.
9. Differentiate between routine and strict criteria for evaluation of sperm morphology.
10. Given an abnormal result in the routine semen analysis, determine additional tests that might be performed.
11. Describe the two routinely used methods for detection of antisperm antibodies.
12. List two methods for identifying a questionable fluid as semen.
13. State the World Health Organization normal values for routine and follow-up semen analysis.
14. Discuss the types and significance of sperm function tests.
15. Describe methods of quality control appropriate for the semen analysis.

**Synovial Fluid**

Learning Objectives

Upon completion of this unit, the student will be able to:

1. Describe the formation and function of synovial fluid.
2. Relate laboratory test results to the four common classifications of joint disorders.
3. Determine the appropriate collection tubes for requested laboratory tests on synovial fluid.
4. Describe the appearance of synovial fluid in normal and abnormal states.
5. Discuss the normal and abnormal cellular composition of synovial fluid.
6. List and describe six crystals found in synovial fluid.
7. Explain the differentiation of monosodium urate and calcium pyrophosphate crystals using polarized and compensated polarized light.
8. State the clinical significance of glucose and lactate tests on synovial fluid.
9. List four genera of bacteria most frequently found in synovial fluid.
10. Describe the relationship of serologic testing of serum to joint disorders.
11. If available, analyze synovial fluid for the presence of crystals and cells.
**Serous Fluid**

**Learning Objectives**

Upon completion of this unit, the student will be able to:

1. Describe the normal formation of serous fluid.
2. Describe four primary causes of serous effusions.
3. Differentiate between a transudate and an exudate, including etiology, appearance, and laboratory tests.
4. Differentiate between a hemothorax and a hemorrhagic exudate.
5. Differentiate between a chylous and a pseudochylous exudate.
6. State the significance of increased neutrophils, lymphocytes, eosinophils, and plasma cells in pleural fluid.
7. Describe the morphologic characteristics of mesothelial cells and malignant cells.
8. List three common chemistry tests performed on pleural fluid, and state their significance.
9. State the common etiologies of pericardial effusions.
10. Discuss the diagnostic significance of peritoneal lavage.
11. Calculate a serum-ascites gradient, and state its significance.
12. Differentiate between ascitic effusions of hepatic and peritoneal origin.
13. State the clinical significance of the carcinoembryonic antigen and CA 125 tests.
14. List four chemical tests performed on ascitic fluid, and state their significance.
15. If available, perform a physical and chemical analysis on a serous fluid.

**Amniotic Fluid**

**Learning Objectives**

Upon completion of this unit, the student will be able to:

1. State the functions of amniotic fluid.
2. Describe the formation and composition of amniotic fluid.
3. Describe the specimen handling and processing procedures for testing of amniotic fluid for bilirubin, fetal lung maturity (FLM), and cytogenetic analysis.
4. Discuss the principle of the spectrophotometric analysis for evaluation of hemolytic disease of the newborn.
5. Interpret a Liley graph.
6. Describe the analysis of amniotic fluid for the detection of neural tube disorders.
7. Explain the physiologic significance of the lecithin-sphingomyelin (L/S) ratio.
8. State the relationship of phosphatidyl glycerol to FLM.
9. Discuss the principle of and sources of error for the L/S ratio, Amniostat-FLM, Foam Stability Index, and microviscosity tests for FLM.
10. Describe the relationship of lamellar bodies to FLM and the laboratory tests performed.
Fecal Analysis

Learning Objectives

Upon completion of this unit, the student will be able to:

1. Describe the normal composition of feces.
2. Differentiate between secretory and osmotic diarrhea.
3. Instruct patients in the collection of random and quantitative stool specimens.
4. State a pathogenic and a nonpathogenic cause for stools colored red, black, and pale yellow.
5. State the significance of bulky, ribbon-like, and mucus-containing stools.
6. State the significance of increased neutrophils in a stool specimen.
7. Describe a positive microscopic examination for muscle fibers.
8. Name the fecal fats stained by Sudan III, and give the conditions under which they will stain.
9. Describe and interpret the microscopic results that will be seen when a specimen from a patient with steatorrhea is stained with Sudan III.
10. Explain the principle of the guaiac test for occult blood and the reasons that guaiac is the reagent of choice.
*11. Perform and interpret a guaiac test for occult blood without error.
11. Instruct a patient in the collection of specimens for occult blood, including providing an explanation of dietary restrictions.
12. Briefly describe a chemical screening test performed on feces for each of the following: fetal hemoglobin, pancreatic insufficiency, and carbohydrate intolerance.

Description of Assessment and/or Evaluation of Student Learning

Examinations, practicals, laboratory assessments, case studies

Master Syllabi and Working Syllabi (if both are used)

URINALYSIS AND BODYFLUIDS

CLINICAL LABORATORY TECHNOLOGY 1502/1502L

SYLLABUS SPRING

Course Goal: The course will provide information and guidelines for analyzing a variety of body fluids and information regarding the significance and testing of some of the metabolic diseases

Course Description:

CLT 1502, Urinalysis and Body Fluids Theory and techniques in the analysis of urine and body fluids, taken concurrently with CLT 1502L. Prereq: Biology 2601, CLT 1501/1501L. (2sh)

CLT 1502L, Urinalysis and Body Fluids; Chemical and microscopic examination of urine with emphasis on cells, casts, and other formed elements. Three hours of lab a week. Prereq: Biology 2601 and CLT 1501. Taken concurrently with CLT 1502.
Required Texts
Urinalysis and Body Fluids: A Color Atlas & Text (Linne & Rinsgrud,) Mosby
Laboratory Manual: CLTEC 1502 Laboratory Manual, Urinalysis & Body Fluids, Boyd

Materials needed:
1. Lab Coat (furnished)
2. Hand bound notebook
3. Gloves (furnished)
4. Laboratory Specimens (from hospitals and CCM Clinics)
5. Goggles (bookstore)

Materials Fee: supports laboratory instructions and supplies.

SAFETY
All students should become familiar with safety rules. Refer to chapter 1 in textbook. All accidents report immediately to your instructor.

THE STUDENT IS REQUIRED TO WEAR A LAB COAT FOR ALL LABORATORY SESSIONS, AND GLOVES SHOULD BE WORN WHEN DRAWING BLOOD OR HANDLING BODY FLUIDS.

Policies for absenteeism and Academic honesty (pg. 35 in YSU Bulletin) Students are urged to read this section.

Class Schedule: Lab Schedule:
Mondays & Wednesday 9:30 – 11:00 Rm. #3071 Wednesdays 11:1:50 Rm. #2096

Instructor: Dr. Joan L. Boyd, Ph.D.
Office: Cushwa Rm. #3074

Holiday: *University closed Monday, January 16 – Martin Luther King Day

Final Lecture Exam. Will be announced
Final Lab exam Wednesday Wednesday, May 3, 2006

All examinations will cover material from the assigned readings in the text and manual. Some of the assigned readings will not be covered in lectures because of time factor, but students are responsible for the information, lecture notes, outside assignments, such as kodachrome slides, movies, and guest lecturers.

STUDENT'S ROLE:
The student will be expected to attend all class sessions, to read the assigned chapters
in the text, pass examinations addressing the information from the text, articles, presentations, and lectures.

Students unable to attend scheduled exams must document their absence and they will be given an exam different from the regularly scheduled exam. The instructor will have the option of adjusting the final grade score bordering two grade levels up or down depending on attendance.

**Lecture Exam schedule**

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<tr>
<th>Grading policy</th>
<th>Tentative schedule</th>
<th>Grading scale</th>
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<tr>
<td>First exam 27%</td>
<td>February 15, 2006</td>
<td>A = 90 - 100</td>
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<tr>
<td>Second exam 27%</td>
<td>March 22, 2006</td>
<td>B = 80 - 89</td>
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<tr>
<td>Final exam 40%</td>
<td>May 10, 0800</td>
<td>C = 70 – 79</td>
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<td>6 points attendance</td>
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(Repeat Course)

**LECTURE TOPICS**

Chapter 1: Regulations Safety/Quality Assurance

Chapter 2: Introduction to Urinalysis
   A. History
   B. Definition
   C. Renal Anatomy & Physiology
   D. Urine composition, Normal Urine, Reference & Identification
   E. Specimen collection, preservation and types
   F. Review question at end of chapter

Chapter 3: Physical Properties of Urine
   A. Color, appearance, odor
   B. Specific gravity
   C. Clinical Correlations
   D. Review questions

Chapter 4: Chemical Examination
   A. PH, Specific Gravity, Protein, Glucose, Ketones, Bilirubin, Blood, leukocyte & confirmatory tests
   B. Leukocyte Esterase, Organisms that reduce nitrates to nitrite
   C. Clintest,
   D. Urobilinogen and Porphobilinogen
   E. Relationship between urine bilirubin and urobilinogen
   F. Causes of myoglobinuria
G. Misuse of Urine chemistry tests, interference’s, specificity of all chemical tests
H. Review Questions

Chapter 5: Microscopic Examination of the Urine
A. Specimen preparation, standardization & Requirements
B. Quality control in urine, Standardization
C. Microscopic & Staining Techniques
D. Fat in urine
E. Urine sediment stains

Chapter 6: Urine sediment constituents

Chapter 7: Body Fluids
A. Spinal Fluids
B. Synovial Fluids
C. Serous Fluids
D. Transudates vs Exudates
E. Semen Analysis
F. Amniotic Fluids
G. Review questions

Special Urinalysis Screening Tests (Manual)
A. Overflow vs Renal Disorders
B. Amino Acid Disorders
C. Tryptophan Metabolism Disorders
D. Cystine Metabolism Disorders
E. Porphyrin
F. Other screening tests

Case Histories (Manual)

LABORATORY SYLLABUS
CLTEC 1502L

All Laboratory exercises will be listed in the manual with page numbers.

EXERCISES TYPE
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<td>Physical and Chemical Examination of Urine – Manual and Automatic</td>
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<td>2</td>
<td>Physical and Chemical, Automatic Chemical Analysis, microscopic</td>
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<td>3</td>
<td>Microscopic Analysis, Unknowns, Urine Slides to review</td>
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<td>4</td>
<td>Protein Analysis</td>
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<td>5</td>
<td><strong>Midterm Practicum (will be announced, 30% of grade)</strong></td>
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<td>Glucose Procedure</td>
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<td>Ketones – Microscopics</td>
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<td>Microscopics</td>
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<td>10</td>
<td>Review Slides &amp; Case studies</td>
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<tr>
<td>11</td>
<td><strong>Final Exam, Week before Finals May 3, 2006, 40% grade</strong></td>
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**EACH STUDENT IS RESPONSIBLE FOR THE IDENTIFICATION OF 30 MICROSCOPIC SLIDES (30% of grade).**

Additional Documentation
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<th>OBR Use</th>
<th>Action</th>
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Ohio Articulation Number Form Directions

This form is used to submit your course information to the Ohio Board of Regents, for all courses that make up OAN requirements. This document is a form, so the only fields that need to be filled in can be. When you open this, make sure the top of the screen, where the name of the document is displayed, says “Document1” or something similar to that. When you open this form from a location other than inside of word, it creates a blank template to fill in. Please fill it in with the appropriate course information from your institution. All of the fields in this document are expandable, and will grow to fit as much data in them as you need. Note that these fields are implemented as MS Word tables. Keep that in mind as you are copying and pasting between your syllabi and this form.

Once you are done entering your course information, you need to save this file. Since Word opened a blank version of this file, you will need to rename it to save it. Under file, choose “Save as” and then enter the name of the file. The naming scheme for this form is Institution-Year-OAN number-Course Title.

Example, if you were ABC Community College, and you were submitting your Calculus110 course, the name of the file would be ABC-2005/06-OMT005-Calculus110. If two (or more) courses are required to fulfill that same OAN, you would submit ABC-2005/06-OMT005-Calculus110-Calculus111.

When you are done with your submissions, please send them electronically to the Ohio Board of Regents at atpanels@regents.state.oh.us so we can keep your information on file.

If you encounter any problems or have any questions, please contact any of the individuals listed bellow:

Jim Ginzer (614) 752-9486 jginzer@regents.state.oh.us
Sam Stoddard (614) 752-9532 ssstoddard@regents.state.oh.us
Nick Wilson (614) 466-4158 nwilson@regents.state.oh.us