BARTON COMMUNITY COLLEGE
COURSE SYLLABUS

I. GENERAL COURSE INFORMATION

Course Number: MLTC 1500
Course Title: MLT Urinalysis and Body Fluids
Credit Hours: 3
Prerequisite: Phlebotomy national certification eligibility and Anatomy & Physiology and General Microbiology and Fundamentals of Chemistry passed with the minimum of a C or instructor permission.
Division/Discipline: Workforce Training and Community Education Division, Medical Laboratory Technology Program
Course Description: This course will provide the student with in-depth knowledge of kidney function, urine formation, and the procedures utilized in performing a routine urinalysis and body fluid analysis. Correlation of abnormal findings and disease states will be discussed. Other body fluids included in this course are feces, seminal, amniotic, cerebrospinal, pleural, pericardial, and peritoneal. Discrimination between normal and abnormal findings and correlation of this knowledge to disease states will be included in the course material. Hands-on laboratory time is required.

II. INSTRUCTOR INFORMATION

III. COLLEGE POLICIES

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage.)

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at disabilityservices@bartonccc.edu

IV. COURSE VIEWED IN THE TOTAL CURRICULUM:

This is one of a series of technical courses for the Medical Laboratory Technology Program. This course is designed to develop the knowledge, competencies, critical

thinking and useful, job-oriented skills in urinalysis and body fluids for laboratory testing and result correlation. It includes, at a minimum, information from the current Body of Knowledge for Medical Laboratory Technicians.

Students planning to transfer credit for a baccalaureate degree will be granted transfer credit only as determined by the four year institution.

The transferability of all college courses will vary among institutions, and perhaps even among departments, colleges, or programs within an institution. Institutional requirements may also change without prior notification. Students are responsible to obtain relevant information from intended transfer institutions to ensure that the courses the student enrolls in are the most appropriate set of courses for the transfer program.

V. ASSESSMENT OF STUDENT LEARNING

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

<u>Course Outcomes, Competencies, and Supplemental Competencies:</u>

A. Relate the proper specimen collection and handling, type of quality control used, reference ranges, principle of analysis currently available, and sources of analytical errors for each of the analytes discussed or approached in the course.
   1. Compare and contrast quality assurance procedures and quality control for specimens, reagents, control material, instrumentation, methodology, and result reporting in the laboratory.
   2. Define pre-analytical, analytical, and post-analytical as it applies to quality control and quality assurance programs.
   3. Describe the four levels of (Clinical Laboratory Improvement Act) CLIA ’88 complexity model and how they relate to urinalysis/ body fluid testing.

B. Perform all procedures with regard to prescribed safety protocol and confidentiality.
   1. Describe the precautions addressed by Universal Precautions, Body Substance Isolation, and Standard Precautions.
   2. Describe and define the use of personal protection equipment used by laboratory personnel.
   3. Correctly describe routine hand washing.
   4. Discuss the components and purpose of the Chemical Hygiene Plan, Safety Data Sheets (SDS or MSDS), National Fire Protection Agency (NFPA) labeling system, and fire extinguishers labeling code.

C. Correlate abnormal results with the most likely disease process by determining the clinical significance of the findings.
   1. Evaluate case studies.

D. Identify the forces involved in fluid formation in the body and correlate the body cavity with containing fluid.
   1. List and define the major processes comprising urine formation.

E. Describe the basic physiology and anatomy of the kidney and relate this function to normal and abnormal test results.
   1. Describe the major function of the kidney.
   2. List the major parts of the urinary system and state the function of each part.
   3. List and define the major parts of a nephron and state the function of each part.

F. Describe the disease states of the renal system as to etiology, clinical symptoms, and expected laboratory results.
   1. Describe and evaluate the following:
      a. Glomerular disorders.
      b. Tubular disorders.
      c. Vascular disorders.
      d. Renal failure.
      e. Metabolic disorders.
      f. Carbohydrate disorders.

G. Relate the appropriate method of collection and preservation of urine specimens for all urinalysis testing.
   1. Describe common methods of urine specimen collection.
   2. List and describe different specimen types needed for optimal testing methods.
   3. Explain methods for preserving urine specimens, including advantages and disadvantages.
   4. Analyze reasons for rejection of urine specimens.

H. Perform routine urinalysis and body fluid analysis.
   1. Physical Examination of Urine
      a. Define anuria, oliguria, polyuria, nocturia, and diuresis; correlating associated disease states with each.
      b. List normal range of urine colors and associated physical correlations.
      c. List common terminology to report clarity.
      d. Define specific gravity and state the normal value found in urine.
   2. Chemical Examination of Urine
      a. Describe handling and storage of reagent strips.
      b. Describe instrumentation and proper technique for performance of chemical testing.
      c. Describe chemical testing and reagent composition for the following analytes: pH, protein, glucose, ketones, bilirubin, urobilinogen, blood, nitrite, leukocytes, and specific gravity.
   3. Microscopic Examination of Urine
      a. Explain the general concepts of brightfield, phase contrast, and polarizing microscopy.
      b. Describe procedure for urinary sediment preparation.

   c. Describe microscopic appearance of cells, casts, crystals, bacteria, yeast, sperm, parasites, mucous, and artifacts.
   d. Correlate physical and chemical results with microscopic observations, noting any discrepancies.
4. List reagents and techniques used to identify amino acids, carbohydrates other than glucose, mucopolysaccarides, mucolipids, amino acids, and proteins.
5. Correctly prepare specimens for cell morphology examination and describe and recognize various cell types that occur in body fluids.
6. Relate the origin, composition, the methods of analysis, the diagnostic importance of test results and explain the specific methodology used for each of the following body fluids: cerebrospinal, amniotic, synovial, seminal, feces, pleural, pericardial, and peritoneal.
   a. Cerebrospinal Fluid
      i. Define cerebrospinal fluid, know its anatomical location and function.
      ii. Define cerebrospinal fluid, know its anatomical location and function.
      iii. Outline the use of each of the three tubes used for collection.
      iv. Differentiate cerebrospinal fluid specimens based on color, clarity, and volume.
      v. Name possible pathologic conditions associated with abnormal glucose and protein results.
      vi. Differentiate the cause of a suspected meningitis case when presented with laboratory data.
   b. Amniotic Fluid
      i. Describe the anatomical location, formation, and composition of amniotic fluid.
      ii. Describe specimen handling and processing of amniotic fluid and associated testing methods.
      iii. Define amniocentesis.
      iv. Analyze the method and principle of the following amniotic tests: L/S ratio, Amniostat-FLM, Foam Stability Index, and Liley Graph
   c. Synovial Fluid
      i. Describe formation and function of synovial fluid.
      ii. Describe specimen collection and processing of synovial fluid.
      iii. Describe appearance and viscosity of synovial fluid in normal and abnormal states.
      iv. Describe the cell count, crystal identification, chemical testing, and bacterial identification associated with synovial fluid specimens.
   d. Serous Fluids (pleural, pericardial, and peritoneal)
      i. Define pleural, pericardial, and peritoneal fluid and indicate their respective anatomical locations.
      ii. Compare specimen collection and handling of all serous fluids.
      iii. Evaluate lab procedures for each fluid including cell counts, chemistry, microbiology, cytology, and classification as either transudate or exudate.
   e. Fecal Analysis
      i. Define feces and describe the normal composition of feces.

ii. State a pathogenic and non-pathogenic cause for different coloration, composition, and frequency of stools.
iii. Evaluate occult blood testing, including collection and dietary restrictions.
iv. Examine testing for fecal fats.

f. Seminal Fluid
   i. Explain procedure for specimen collection of semen.
   ii. List methods of analysis and normal values for semen
   iii. Explain post vasectomy semen analysis.

VI. INSTRUCTOR EXPECTATIONS OF STUDENTS IN CLASS

VII. TEXTBOOKS AND OTHER REQUIRED MATERIALS

VIII. REFERENCES

IX. METHODS OF INSTRUCTION AND EVALUATION

X. ATTENDANCE REQUIREMENTS