FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	MLT 2610C
COURSE TITLE:	Clinical Chemistry
PREREQUISITE(S):	None
COREQUISITE(S):	None
CREDIT HOURS:	3
CONTACT HOURS/WEEK:	4
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	
Laboratory:	
Other _____:	4 (Lecture/laboratory combination)
FACULTY WORKLOAD POINTS:	4
STANDARDIZED CLASS SIZE ALLOCATION:	20

CATALOG COURSE DESCRIPTION:

This course instructs students in the theory, clinical correlations, and laboratory procedures related to the study of proteins, enzymes, carbohydrates, lipids, non-protein nitrogen compounds and liver function testing. Included in the course are quality assurance principles, laboratory mathematics, and the study of basic instrumentation principles.

SUGGESTED TEXT(S):	Arneson, W. and Jean Brickell. Clinical Chemistry A Laboratory Perspective, Current Edition FA Davis
IMPLEMENTATION DATE:	January, 1989
REVIEW OR MODIFICATION DATE:	Fall Term, 1996 (971) Fall Term, 2002 (20031) Fall Term, 2008 (2007) – Outline Review 2007

CONTACT HOURS		COURSE TOPICS PER TOPIC
I.	Basic Laboratory Principles	4
	A. Lab Glassware	
	B. Specimen Collection and Handling	
	C. OSHA Chemical Hygiene and Blood Borne Pathogens Standards	
II.	Quality Assurance in Clinical Chemistry	4
	A. Purpose	
	B. Statistical Parameters	
	C. Principle of Variability	
	D. Quality Assurance Program	
	E. Reference Ranges	
III.	Spectrophotometry	3
	A. Principles	
	B. Instrumentation	
	C. Application	
IV.	Laboratory Mathematics	2
	A. Solutions	
	B. Dilutions	
	C. Unit Conversions	
V.	Proteins & Protein Electrophoresis	7
	A. Protein Structure and Function	
	B. Classification	
	C. Laboratory Analysis	
	D. Clinical Correlations	
	E. Principles of Protein Electrophoresis	
	F. Components of Electrophoretic Systems	
	G. Scanning Densitometry	
	H. Interpretation of Protein Electrophoresis Patterns	
VI.	Enzymes	8
	A. Definition and Function	
	B. Structure	
	C. Classification	
	D. Parameters Affecting Enzyme Activity	
	E. Laboratory Analysis	
	F. Clinical Correlations	

COURSE TOPICS (CONTINUED)	CONTACT HOURS PER TOPIC
VII. Electrolytes	6
A. Constituents	
B. Functions	
C. Electrolyte Balance	
D. Regulatory Mechanisms	
E. Laboratory Analysis	
F. Clinical Correlations	
VIII. Carbohydrate Analysis	8
A. Structure and Function	
B. Digestion and Metabolism of CHO	
C. Clinical Correlations	
D. Diabetes Mellitus Diagnosis	
E. Laboratory Analysis	
IX. Lipids and Lipoproteins	6
A. Structure and Function	
B. Digestion and Metabolism of Lipids	
C. Lipoprotein Function and Structure	
D. Laboratory Analysis of Lipids	
E. Lipoprotein Electrophoresis Interpretation	
F. Clinical Correlations	
X. Non-Protein Nitrogen Analysis & Renal Profiling	6
A. NPN Constituents	
B. Renal Regulatory Function	
C. Laboratory Tests in a Renal Profile	
D. Clinical Correlations	
XI. Hepatic Function and Profile	6
A. Anatomy	
B. Functions	
C. Bilirubin Metabolism	
D. Laboratory Tests in a Hepatic Profile	
E. Clinical Correlations	

PROGRAM TITLE: Medical Laboratory Technology

COURSE TITLE: Clinical Chemistry

CIP NUMBER: 0317.030900

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

11.0 APPLY BASIC MATH AND SCIENCE SKILLS -- The student will be able to:

- 11.01 Draw, read, and report on graphs, charts and tables.
- 11.02 Measure time, temperature, distance, capacity, and mass/weight.
- 11.03 Make and use measurements in both traditional and metric units.
- 11.04 Make estimates and approximations and judge the reasonableness of the result.
- 11.06 Demonstrate ability to evaluate and draw conclusions.
- 11.07 Organize and communicate the results obtained by observation and experimentation.
- 11.08 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solution of such questions.
- 11.09 Calculate ratios.

22.0 DEMONSTRATE BASIC KNOWLEDGE OF CLINICAL CHEMISTRY, PERFORM CLINICAL LABORATORY "WAIVED TESTS" -- The student will be able to:

- 22.01 Perform techniques of clinical chemistry related to metric measurement.
- 22.02 Perform techniques of clinical chemistry related to laboratory glassware and equipment.
- 22.03 Perform techniques of clinical chemistry related to reagent preparation, laboratory equipment and laboratory techniques.
- 22.04 Discuss techniques of clinical chemistry related to preparation of protein free filtrate and chemical tests.
- 22.05 Discuss techniques of clinical chemistry related to standardization of procedure and use of standards, blanks and controls.
- 22.06 Discuss techniques of clinical chemistry related to visual colorimetry; calibration and use of the spectrophotometer.
- 22.07 Discuss basic techniques of clinical chemistry related to normal and abnormal physiology.

25.0 DISCUSS ANATOMY AND PHYSIOLOGY OF THE HUMAN BODY AS IT RELATES TO THE FIELD OF MEDICAL LABORATORY TECHNOLOGY -- The student will be able to:

- 25.01 Identify the major body systems and their anatomical features.
- 25.02 Explain the physiology processes in the human system necessary to influence and maintain homeostasis.

LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S): TITLES(S):

26.0 DISCUSS THE GENERAL RESPONSIBILITIES AND FUNCTIONS ENCOUNTERED BY A MEDICAL TECHNICIAN -- The student will be able to:

- 26.01 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions.
- 26.02 Organize and communicate the results obtained by observation and experimentation.
- 26.03 Demonstrate ability to evaluate and draw conclusions.
- 26.04 Demonstrate knowledge of anatomy and physiology of body systems.
- 26.05 Demonstrate ability to report observations in written or oral form.

27.0 APPLY QUALITY ASSURANCE PRINCIPLES AND SAFETY PROTOCOLS --The student will be able to:

- 27.01 Recognize specimen suitability and determine need for rejection/recollection using factors described in clinical protocol.
- 27.02 Describe special procedures for transporting and processing specimens.
- 27.03 Describe clinical laboratory role in providing quality assurance in laboratory testing, reporting, and use and maintenance.
- 27.04 Demonstrate all required calibration procedures.
- 27.05 Demonstrate and record all quality control procedures unacceptable results.
- 27.06 Identify and report problems encountered in daily quality control according to standard operating procedures.
- 27.07 Adhere to current OSHA regulations regarding laboratory hazards.

32.0 DEMONSTRATE KNOWLEDGE OF CLINICAL CHEMISTRY PRINCIPLES AND PROCEDURES -- The student will be able to:

- 32.01 Discuss the renal system and related chemistry tests.
- 32.02 Discuss principles of and perform common renal function tests.
- 32.03 Discuss carbohydrate, protein and lipid metabolism.
- 32.04 Discuss principles of and perform commonly ordered tests related to carbohydrate, protein and lipid metabolism.
- 32.05 Discuss the liver and its functions as related to chemistry tests.
- 32.06 Discuss principles of and perform commonly ordered liver functions tests.
- 32.07 Discuss enzyme classification, origin, activity and function.
- 32.08 Discuss principles of and perform commonly ordered enzyme procedures.
- 32.09 Discuss electrolyte balance as related to health and disease.
- 32.10 Discuss principles of and perform electrolyte analyses.
- 32.11 Discuss the physiology of the endocrine system and the principal tests used to determine endocrine function.
- 32.13 Discuss and perform general electrophoresis techniques.
- 32.14 Demonstrate knowledge of principles of instrumentation as related to the clinical chemistry laboratory.

LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S): TITLES(S):

41.0 DEMONSTRATE KNOWLEDGE OF ADVANCED CLINICAL CHEMISTRY PRINCIPLES AND PROCEDURES
-- The student will be able to:

41.01 Perform, calculate, analyze and recognize normal/abnormal electrophoresis procedures.
41.03 Perform, calculate, and recognize associated disease states for selected isoenzyme assays.
41.04 Perform, calculate, and recognize associated disease states for blood lipid profiles.

Florida State College At Jacksonville

Course Learning Outcomes & Assessment

NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1

COURSE PREFIX AND NUMBER: MLT 2610C

SEMESTER CREDIT HOURS (CC): 3
CONTACT HOURS (NCC): _____

COURSE TITLE: Clinical Chemistry

Section 2

TYPE OF COURSE: (Click on the box to check all that apply)

- ☐ AA Elective
- ☒ AS Required Professional Course
- ☐ College Prep
- ☐ AS Professional Elective
- ☒ AAS Required Professional Course
- ☐ Technical Certificate
- ☐ Other _____
- ☐ PSAV
- ☐ Apprenticeship
- ☐ General Education: (For General Education courses, you must also complete Section 3 and Section 7)

Section 3 (If applicable)

INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

- ☐ Communications
- ☐ Social & Behavioral Sciences
- ☐ Mathematics
- ☐ Natural Sciences
- ☐ Humanities

Section 4

INTELLECTUAL COMPETENCIES:

- ☒ Reading
- ☒ Speaking
- ☒ Critical Analysis
- ☒ Quantitative Skills
- ☒ Scientific Method of Inquiry
- ☒ Writing
- ☒ Listening
- ☒ Information Literacy
- ☒ Ethical Judgment
- ☒ Working Collaboratively

Section 5

	LEARNING OUTCOMES	METHOD OF ASSESSMENT
•	Demonstrate laboratory safety for use of bio-hazardous materials and chemicals	Safe participation in all laboratory activities; written exams; safety worksheets
•	Perform specified clinical chemistry lab procedures necessary for entry into practicum	Lab reports; collaborative problem solving
•	Identify discrepancies in laboratory test results that indicate technical errors and/or critical errors	Lab reports; collaborative problem solving; written exams
•	Demonstrate ability to apply7 mathematical formulas to laboratory testing	Lab reports; written exams
•	Explain selected metabolic and organ-related disorders as determined by clinical chemistry lab testing	Written exams
•	Correlate significant lab data as determined by clinical chemistry assays with metabolic and organ-related disorders	Collaborative problem solving; critical thinking exercises; case studies; written exams
•	Determine current scientific findings for selected disorders	Journal article abstracts; written exams
•	Evaluate lab data for precision, accuracy, and relationship to reference ranges	Lab reports; written exams
•	Discuss professional credentialing, medical information privacy, and professional conduct as they apply to medical lab practice	Classroom discussion participation; online forum participation, written exams

Section 6

Name of Person Completing This Form: Merry A. Carter Date: 11/1/2007