Course Inventory Change Request

Date Submitted: 02/11/15 11:20 am

Viewing: MLS 3330: Advanced Clinical Chemistry
Last edit: 02/17/15 11:52 am
Changes proposed by: vhughes

Catalog Pages referencing this course

In Workflow
1. MLS Chair
2. HSC Admin
3. HSC Dean
4. University Curriculum Committee Chair
5. Banner

Approval Path
1. 02/11/15 11:21 am Virginia Hughes (vhughes): Approved for MLS Chair
2. 02/17/15 9:42 am Colleen Hales (hales): Approved for HSC Admin
3. 02/17/15 11:52 am Carole Grady (grady): Approved for HSC Dean

Bachelor of Science in Medical Laboratory Science

Course Prefix: MLS Course Number: 3330
Effective Semester: Spring 2016
Department: Medical Laboratory Science (MLS)
School: School of Health Sciences
Course Title:
Advanced Clinical Chemistry
Short Course Title: Advanced Clinical Chemistry
Credits: 4

Workload Factors: 4
Primary Grade Type: Standard Letter
Secondary Grade Type:
Instructor Permission Required: No
Repeatable for Credit: No
Schedule Type: Combined Hrs/Wk: 5
Lecture/Lab Lecture
Catalog Prerequisites? Yes

Catalog Prerequisites:
Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science.
Grade Required on Prerequisite(s): N/A

Corequisites? No
Course/Lab Fee? Yes-No

Course/Lab Fee Amount: 500-250 Fee Deposit HEA320
Index Code: HEA217
Fee Justification:
Fee increase to cover increasing costs of laboratory reagents and test kits for course.

Instruction Index Code: HEA217
GE Status Requested: No

Catalog Description
Required course for students in the Bachelor of Science Medical Laboratory Science program. Students will perfect problem-solving skills in the correlation of clinical chemistry test results to organ-related diseases such as renal, hepatic, and endocrine diseases. Students will learn how to use clinical correlation as a quality assurance tool to detect patient testing errors while also matching
patient history and laboratory results to disease processes. Therapeutic drug monitoring and toxicology studies are also covered.

Course Rotation:
Spring (every)

Justification for course/change:
funds for lab kits, reagents, and supplies

Library Resources Adequate: Yes

Tech Resources Adequate: Yes

Course Learning Outcomes:

1. Compare and contrast quality assurance, quality control and compliance as they apply to the clinical chemistry laboratory
2. Evaluate the process of validating an instrument in the clinical chemistry laboratory
3. List the governing bodies that provide guidelines for the clinical chemistry laboratory.
4. Identify physical characteristics of samples that may interfere with testing
5. Explain the principles and attributes and limitations of the following toxicology assay principles: Gas liquid chromatography, GCMS, high performance liquid chromatography, immunoassay EIA, Atomic Absorption
6. List drugs present on an ER Tox screen
7. Explain the chemical categories of hormones, and cite an example of each: steroids, polypeptides, amino acid derivatives
8. Identify the most abundant blood thyroid hormone and the most potent thyroid hormone and explain the reason for the increased potency. Identify which of these is the prohormone and which is the intracellular hormone
9. Describe the clinical utility of measuring the following urinary compounds for diseases such as depression, carcinoid tumors, pheochromocytomas, ganglioneuromas, neuroblastomas. Cite reagents used, precursor compounds being indirectly measured and possible interfering substances from the diet: urinary 5HIAA and serotonin, urinary VMA, urinary metanephrines, urinary catecholamines, urinary HVA
10. Explain why the measurement of progesterone, estriol, and hcg are useful to the physician monitoring placental development and fetal well being
11. Describe the major parts of the nephron and explain how each part contributes to the formation of urine, and to renal function
12. Explain the meaning and clinical significance of microalbuminemia for the treatment of hypertension for diabetic patients
13. Explain each of the four hepatocyte processes during the clearance of blood compounds, and identify the process that is most affected by hepatic stress or disease: uptake, storage, biotransformation, biliary excretion
14. List three classes of acute hepatitis
15. Preform titrations of acids and bases
16. Compare and contrast assayed QC and unassayed QC
17. Compare and contrast manual immunoassay from automated immunoassay
18. List current instruments which perform TDM.
19. Describe two methods currently used in TDM.
20. Correlate lab values involving TDM with associated disease states.
21. Review both correct and erroneous printouts from analyzers performing TDM and provide rationale of the erroneous results.
22. Describe time limits of Troughs and Valleys for specific analytes regarding time of draw in relation to dose given and how lab results are affected if time specifications are not followed.
23. Explain the principles of Gas-liquid chromatography, GCMS, HPLC, Immunoassay EIA, Atomic Absorption.
24. Explain the relationship of solubility and volatility of ionizable analytes with respect to them being either in ionized form or unionized form.
25. Explain the utility of serum Osmolal Gap as part of a toxicology screen.
27. Compare the biological half lives of the following categories of hormones: steroids, polypeptides, amino acid derivatives
28. Perform the following analyses in the laboratory: K, Na, Cl-, CO2, BUN, creatinine, total protein, glucose, osmolality (serum and urine), cholesterol, triglycerides, ALT, ALP, troponin, drugs of abuse.

How do your Course Learning Outcomes align to your Program Learning Outcomes?

Compare and contrast quality assurance, quality control and compliance as they apply to the clinical chemistry lab, List the governing bodies that provide guidelines for the clinical chemistry laboratory, Identify physical characteristics of samples that may interfere with testing, Explain the principles and attributes and limitations of the following toxicology assay principles: Gas liquid chromatography, GCMS, high performance liquid chromatography, immunoassay EIA, Atomic Absorption, List drugs present on an ER Tox screen, Explain the chemical categories of hormones, and cite an example of each: steroids, polypeptides, amino acid derivatives, Identify the most abundant blood thyroid hormone and the most potent thyroid hormone and explain the reason for the increased potency. Identify which of these is the prohormone and which is the intracellular hormone, Describe the clinical utility of measuring the following urinary compounds for diseases such as depression, carcinoid tumors, pheochromocytomas, ganglioneuromas, neuroblastomas. Cite reagents used, precursor compounds being indirectly measured and possible interfering substances from the diet: urinary 5HIAA and serotonin, urinary VMA, urinary metanephrines, urinary catecholamines, urinary HVA, Explain why the measurement of progesterone, estriol, and hcg are useful to the
physician monitoring placental development and fetal well being, Describe the major parts of the nephron and explain how each part contributes to the formation of urine, and to renal function, Explain the meaning and clinical significance of microalbuminemia for the treatment of hypertension for diabetic patients, Explain each of the four hepatocyte processes during the clearance of blood compounds, and identify the process that is most affected by hepatic stress or disease: uptake, storage, biotransformation, biliary excretion, List three classes of acute hepatitis align with PLO6 (demonstrate knowledge of chemistry). Evaluate the process of validating an instrument in the clinical chemistry lab align with PLO3 (evaluate and interpret lab test data). Perform titrations of acids and bases, Perform the following analyses in the laboratory: K, Na, Cl-, CO2, BUN, creatinine, total protein, glucose, osmolality (serum and urine), cholesterol, triglycerides, ALT, ALP, troponin, drugs of abuse align with PLO2 (perform accurate testing of lab specimens from body fluids, cells, and other substances). Compare and contrast assayed QC and unassayed QC
Compare and contrast manual immunoassay from automated immunoassay, List current instruments which perform TDM, Describe two methods currently used in TDM, Correlate lab values involving TDM with associated disease states, Review both correct and erroneous printouts from analyzers performing TDM and provide rationale of the erroneous results.
Describe time limits of Troughs and Valleys for specific analytes regarding time of draw in relation to dose given and how lab results are affected if time specifications are not followed.
Explain the principles of Gas-liquid chromatography, GCMS, HPLC, Immunoassay EIA, Atomic Absorption, Explain the relationship of solubility and volatility of ionizable analytes with respect to them being either in ionized form or unionized form, Explain the utility of serum Osmolal Gap as part of a toxicology screen, Explain the principle of the Biosite Diagnostics Triage urine drug screen, Compare the biological half lives of the following categories of hormones: steroids, polypeptides, amino acid derivatives align with PLO6 (demonstrate knowledge of chemistry).

Schedule of lesson activities that meet
Course Learning Outcomes
  lectures, student labs, lecture exams, lab practicals, case studies-

Assessment activities that provide evidence of student learning
  Four lecture exams, one final exam, two lab practicals-

Course Reviewer Comments
dwade (02/02/15 11:40 am): Rollback: Virginia asked for rollback
dwade (02/10/15 9:42 am): Rollback: DW made changes to workflow and require a rollback. Pls resubmit.