Berkshire Medical Center

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Berkshire Medical Center
School of Medical Laboratory Science

Course Syllabus

Course No. MEDT 401
Course Title: Clinical Chemistry

Credits: 8 (through affiliated colleges/universities affiliation agreements)

Description:
Introduces the student to the physiology of the organ systems of the body and the various analytes that interact with them. Discusses abnormal physiology as it relates to various disease states. Describes the controllable and non-controllable pre-analytical, analytical, and post-analytical variables that can affect testing. Discusses the principles of test methodology. The student applies this theory to the clinical lab using current diagnostic techniques and instrumentation to correlate lab results to disease processes.

Primary Didactic Instructor: Kari Murad, Ph.D.
Scientific and Technical Manager
kmurad@bhs1.org
413-553-9029
Alternate didactic Instructor: Dr. David Jones, M.D., Pathologist
djones3@bhs1.org
Lead Clinical Instructor: Jeanne Siemer, MLS(ASCP)
jsiemer@bhs1.org

Required text:
Clinical Laboratory Chemistry, 2018, Robert Sunheimer, 2nd edition.

The Chemistry, Toxicology and Immunology Department online procedures.

Reference book: Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics, 8th ed., Rafai, Horvath and Wittwer, 2018

Lecture: 1.0 – 1.5 hour lecture every week August through May
Additional lectures scheduled as needed

Laboratory: 7 week combined clinical rotation
**See individual student schedule for dates

Course Goals and Objectives

Based on the didactic material and clinical instruction students will score an average of 75% or better on evaluation tools (i.e. exams, evaluations, exercises, etc) to demonstrate competency of the following objectives.

Upon completion of the Chemistry clinical and didactic course the student will:

1. Develop an entry-level knowledge of chemistry tests used in the clinical laboratory and their importance in the diagnosis and treatment of disease.
2. Explain the importance of the specific analytes in the chemistry department and their relationship to certain clinical disorders/conditions.
3. Discuss physiological mechanisms that lead to specific chemical imbalances/disorders and describe the clinical manifestations.
4. Discuss the current prevention and treatment for disorders related to disruptions in body chemistry.
5. Explain the principles and methodologies of each test performed in the chemistry laboratory.
6. Explain the importance of quality control and apply it in the chemistry laboratory.
7. Determine appropriate specimen collection, processing, and analysis of patient specimens by following established procedures and resolve issues as they arise.
8. Perform manual and automated testing on patient blood or body fluids that result in valid laboratory results in the Chemistry department.
9. Perform routine maintenance, trouble shooting, quality control, and calibrations on instrumentation in the Chemistry department following established procedures.
10. Evaluate quality control data and determine course of action when quality control falls outside of range.
11. Interpret laboratory data generated from the Chemistry laboratory regarding test accuracy and abnormal values.
12. Evaluate laboratory data and give possible cause or diagnosis for patient results.
13. Organize workflow for efficiency in lab testing turn-around-times.
14. Practice established confidentiality guidelines.
15. Demonstrate professional and ethical conduct with all healthcare professionals, consumers, patients, and other laboratory students.

Basis for Student Evaluation

Lecture evaluation will consist of exams and assigned exercises. The laboratory evaluation will consist of written exams, task lists, clinical performance, and affective evaluation. The final grade will be composed of 60% lecture and 40% laboratory. See Chemistry grade sheet for specific breakdown.

Chemistry lectures: July - May
Lab statistics 4 lectures
QA/QC
Method Validation
Lab Stats/QC quiz

Instrumentation 3 lectures
Instrumentation Quiz
Urinalysis 2 lectures
Urine quiz
Urinalysis 3 lectures
Urine exam
Carobohydrate 2 lectures
Non protein nitrogens (NPN)
Carbohydrate/NPN exam
PROTEINS 1/4 4 lectures
Protein quiz
IRON - to coincide with iron def. anemia lecture
FLUID & ELECTROLYTES 2 lectures
Fluid and lytes quiz
ACID BASE 2 lectures
Acid Base/Blood Gas Quiz
PORPHYRIAS - to be scheduled near heme iron lecture
Porphyria Quiz
BASIC ENDOCRINOLOGY
ENDROCRINOLOGY: PITUITARY
ENDOCRINOLOGY: ADRENAL
Endo Quiz I- Basic, Adrenal, Pituitary
Reproductive endocrinology 2 lectures
ENDOCRINOLOGY: TUMOR MARKERS
ENDOCRINOLOGY: THYROID
Endo Quiz II - Sex hormones, Tumor Markers, Thyroid
ENZYMOLOGY 5 lectures
Enzymology Quiz
MINERAL BONE METABOLISM
GI TRACT/PANCREAS
Bone, GI tract Quiz
CHOLESTEROL/LIPIDS
LIVER FUNCTION
Lipids, Liver Quiz
TOXICOLOGY/THERAPEUTIC DRUG MONITORING 4 lectures
Toxicology/TDM Quiz
HIV
Hepatitis
Vitamins and Trace Minerals
HIV/Hepatitis Quiz

Affective behaviors

Didactic
Following appropriate training, during didactic instruction the student will:

1. Exhibit professional behavior during didactic instruction.
2. Attend lectures in a timely manner.
3. Respect other students and members of the laboratory.
4. Contribute to a positive learning environment.
5. Demonstrate an interest in the subject matter.
6. Comply with hospital and laboratory dress code and personal appearance policies.
7. Comply with institutional policies concerning safety and confidentiality.
8. Cooperate when situations arise and there is a necessary change in lecture schedule.
9. Participate in creating an inclusive learning environment.

Clinical
Following appropriate training, during clinical instruction the student will:

1. Comply with all hospital, laboratory, and school policies.
2. Demonstrate phone etiquette using BHS customer service standards.
3. Maintain a neat, clean, and orderly work area in the Chemistry department.
4. Value the advice and opinion of others.
5. Accept responsibility for their own actions notifying instructor or supervisor of any errors.
6. Be dependable and punctual for the clinical experience.
7. Organize their time to complete assignments and daily training.
8. Accept constructive feedback and use it as a tool for improved performance.
9. Establish a good rapport with departmental staff and uphold the concept of teamwork.
10. Cooperate when situations arise and there is a necessary change in lecture schedule.
11. Comply with hospital and laboratory dress code and personal appearance policies.
12. Contribute to a positive, inclusive clinical training environment.

Attendance

Students follow the School of MLS attendance policy. Students are allotted 80 hours for personal time and sick time during the course of the internship. The Program Director and clinical department must be notified of any sudden absence as soon as possible. The main lab number may be called 24 hours a day to notify the lab of an absence. The Program Director should be emailed to document the absence.
Any coursework or clinical training missed over the 80 hours allowed, will require consultation with the Program Director as to the course of action to make up lost training time.

Snow days
Cancellation of classes or clinical training due to inclement weather will be at the discretion of the Program Director.