Course Goals: Instruction in the diagnosis of kidney and liver diseases is given. Students will receive comprehensive instruction in anatomical and physiological aspects of these organs (both in health and disease) as the basis for understanding how and why analytes change in disease processes. Aspects of laboratory methodology for measuring analytes pertinent to kidney and liver diseases will also be presented. Laboratory statistics will also be taught.

August 24  Lecture 1: Kidney Anatomy and Function (Read Kidney Chapter 1)

August 26  Lecture 2: Body Water Compartments; Composition of Body Fluids, Component Movement Across Membranes (Diffusion, Osmotic Pressure, Active Transport, Membrane Potential) (Read Kidney Chapter 2)

August 31  Lecture 3: Component Movement Across Membranes (Gibbs-Donnan Equilibrium); Control of Blood Flow; Introduction to Blood Pressure Control (Read Kidney Chapter 3)

September 2  Lecture 4: Blood Pressure Control [Baroreceptors, Chemoreceptors, CNS Ischemic Response, Hormonal Control (Angiotensin II, ADH, Catecholamines), Stress Relaxation, Capillary Fluid Shift]

September 7  No Class - Holiday

September 9  Lecture 5: Glomerular Filtration Rate and Autoregulation (Mechanisms of Arteriole Diameter Change, Nervous System Override); GFR in Disease (Read Kidney Chapter 4)

September 14  Lecture 6: Plasma Clearance; Measurement of GFR and RBF; Introduction to Kidney’s Control of Sodium and Water Reabsorption (Read Kidney Chapter 5)

September 15  Review session for Exam I, (to be scheduled)

September 16  Lecture 7: Mechanisms of Sodium and Water Reabsorption in the Proximal Tubule and Loop of Henle; Glomerular Tubular Balance (Read Kidney Chapter 6)

September 18  Review session for Exam I, 4-6PM

September 21  Exam I [Covering material Lectures 1-6 (includes Plasma Clearance; Measurement of GFR and RBF only)] (3-6 PM)

September 23  Lecture 8: Mechanisms of Sodium and Water Reabsorption in the Distal Tubule, and Connecting Segment and Collecting Ducts; Regulation of Extracellular Fluid Volume (through Hormones) (Read Kidney Chapter 7)

September 28  Lecture 9: Regulation of Extracellular Fluid Volume (cont.); Regulation of Extracellular Fluid Osmolarity; Disorders of Sodium Depletion (up to explaining Extrarenal Loss of Na+)

September 30  Lecture 10: Disorders of Sodium Depletion (Cont.) and Sodium Excess

October 5  Lecture 11: Potassium Physiology; Hypokalemia [up to Clinical Manifestations (partially covered)]

October 7  Lecture 12: Hypokalemia (cont.)

October 12  No Class – Holiday - Review session for Exam II, 4-6 PM

October 14  Lecture 13: Hyperkalemia, Liver Anatomy and Function (through Kupfer Cells and Macrophages) (Read Liver Chapter 1)
October 16  Review session for Exam II, 4-6 PM

October 19  Exam II [Covering material Lectures 6-13 (Intro to Kidney’s Control of Sodium and Water Readsorption through Hyperkalemia)] (3-6 PM)

October 21  Lecture 14: Liver Anatomy and Function (cont.); Formation and Metabolism of Bilirubin; Spleen Function; Metabolism of Bilirubin Spleen (Read Liver Chapter 2)

October 26  Lecture 15: Bilirubin Metabolism; Methodsologies for Bilirubin Determination

October 28  Lecture 16: Overview of Hyperbilirubinemia; Hemolytic Anemia (Manifestation and Laboratory Diagnosis); Hemolytic Anemias (Membrane Defects)

November 2  Lecture 17: Hemolytic Anemia (Enzyme Defects); Hemoglobin in Development and Types of Hemoglobin; Hemolytic Anemia (Sickle Cell Syndromes); General Aspects of Thalassemias

November 4  Lecture 18: Hemolytic Anemias (Thalassemias); Hemoglobin Electrophoresis;

November 9  Lecture 19: Hemolytic Anemias (Hypersplenism, Autoimmune, Drug Causes); Other Causes of Hyperbilirubinemia (Congenital Defects, Hepatocellular Disease, Cholestatic Conditions); Laboratory Diagnosis of Cholestasis

November 11  No Class – Holiday - Review session for Exam III, 4-6 PM

November 13  Review session for Exam III, 4-6 PM

November 16  Exam III (Covering material Lectures 13-18) (3-6 PM)

November 18  Hepatitis, General Aspects, Hepatitis A, B, C, D (Clinical and Laboratory Diagnostic Issues)

November 20  Extra class

November 23  Lecture 20: Accuracy and Precision; Gaussian Distribution; Z-Values

November 25  Lecture 21: Confidence Intervals; Standard Error of the Mean

November 30  Lecture 22: T-Values; Determining Whether Means are Different

December 2  Lecture 23: Quality Control and Assessing Quality Control (Levy-Jennings Plot; Power Functions Westgard Multi-Rules); Absolute Allowable Error; Sensitivity, Specificity, Predictive Values of Laboratory Tests

December 4  Review session for Exam IV, 4-6 PM

December 7  Exam IV (Covering material Lectures 19-23) (4-7 PM)

Required References: Website Address: www.mysu.csuohio.edu/sciences/students/class/anderson/chm651751.html [or go to: www.csuohio.edu/sciences - click on "myCOS" - click on "For Students" - click on "Classes" - click on "Anderson" - click on "CHM-651/751"]

Handouts on website: Kidney Chapters 1-7; Liver Chapters 1-2; Slides Lectures 1-19
Handouts in Class: Problem Set and Answers for Lectures 20-23; Slides Lectures 20-23

Grading:

<table>
<thead>
<tr>
<th>Lecture Exams</th>
<th>Each count 25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-85</td>
<td>A</td>
</tr>
<tr>
<td>82-84</td>
<td>A-</td>
</tr>
<tr>
<td>78-81</td>
<td>B+</td>
</tr>
<tr>
<td>70-77</td>
<td>B</td>
</tr>
<tr>
<td>65-69</td>
<td>B-</td>
</tr>
<tr>
<td>50-64</td>
<td>C</td>
</tr>
</tbody>
</table>