1. Textbook pages that you can skip in chapter 51
   - Distinguishing Environments & animals: pp. 911 – 912
   - Excreting nitrogen: pp. 912 – 913
   - Invertebrates: pp. 914 – 915
   - Conserving water: pp. 917 – 918
   - Acid-base: p. 923

2. Roadmap of the lecture
   * function of the kidney
   * vascular and tubular components of the nephron
   * anatomy of the human kidney: location and role of the different parts of the nephron
   * 3 basic processes: filtration, reabsorption, secretion
   * composition of the fluids after filtration, and after tubular reabsorption
   * autoregulatory mechanisms for control of GFR (glomerular filtration rate)
   * general principle for regulation of water reabsorption
   * role of the loop of Henle in setting up a gradient in the medulla
   * hormonal control of water reabsorption (direct and indirect) and vasoconstriction
     [events occurring in response to a drop in blood pressure]

3. Study guide
   After studying for this lecture, you should be able to:
   - Know the roles of the kidney
   - Describe the anatomy of the nephron in terms of the vascular and tubular components, and the location of each part of the nephron in the cortex and the medulla
   - Know the role of the following structures: afferent arteriole, efferent arteriole, glomerulus, vasa recta, peritubular capillaries, Bowman’s capsule, proximal and distal convoluted tubules, loop of Henle, collecting duct
   - Describe the process of glomerular filtration
   - Know the composition of the glomerular filtrate and how it differs from that of the blood
   - Describe the autoregulation processes that control the glomerular filtration rate
   - Know the composition of the renal fluid after having passed the proximal convoluted tubule, and how it differs from that of the blood
   - Describe the general principle of how the body can produce urine of varying volume and concentration
   - Describe the gradient that is established in the medulla of the kidney, and the role of the loop of Henle in this process; explain how the medullar gradient is used to produce urine of varying concentration, depending on the body needs
• Compare and contrast the ascending and descending limbs of the loop of Henle in terms of their water and salt permeability, and in terms of the changes in NaCl concentration that occur in the fluid flowing in the limbs
• Know which part of the nephron allows regulated water reabsorption, how this is done, and under what hormonal control
• Understand the correlation between regulation of blood pressure and blood volume
• Describe the events that take place when there is a sudden drop in blood pressure
• Answer the questions below:
  o Which organ releases renin? What does renin do?
  o What is angiotensin? What does it do?
  o Why does stimulation of thirst occur after a sudden drop in blood pressure?
  o What is aldosterone? Which organ releases it? What does it do?
  o What are water channels (or aquaporins)?
  o What is antidiuretic hormone? What does it do? When is it released?