1. Textbook pages that you can skip in chapter 49
   pp. 866-870
   measuring blood pressure: Fig. 49.6
   EKG: p. 875 + Fig. 49-9
   Lymphatic system: p. 877
   Cardiovascular disease: p. 878-879
   Blood: pp. 879-881

2. Roadmap of the lecture
   * anatomy of the human heart
   * description of the cardiac cycle
   * sequence of events in the spontaneous heartbeat
   * comparison of arteries and veins
   * description of capillaries
   * ultrafiltration and reabsorption
   * regulation of circulation: local, nervous and hormonal

3. Study guide

   After studying for this lecture, you should be able to:
   - Draw the anatomy of the heart with arteries and veins + valves
   - Describe the cardiac cycle in terms of changes in pressure in the left ventricle and aorta, and the volume of blood in the left ventricle (know Fig. 49-5)
   - Describe the events during diastole, during systole
   - Describe the electrical events that occur during the spontaneous heartbeat; know the sequence of action potential propagation through the different cell groups
   - Compare and contrast arterioles and venules in terms of anatomy of tissue layers, control of diameter, role
   - Explain why the velocity of blood flow drops in the capillaries
   - Explain how the distribution of fluids between the blood stream and the tissues is controlled
   - Describe the factors that control the exchange of molecules between blood and tissues; what determines ultrafiltration and reabsorption
   - Explain the difference between bulk flow and diffusion; know the major role for each.
   - Describe the hormonal control of blood pressure through control of blood vessel constriction
   - Describe the local mechanisms for control of blood pressure
Describe the nervous mechanisms for control of blood pressure

Answer the following questions:

- When do the sinoatrial valves close? When does the aortic valve close?
- When is the blood pressure in the left ventricle at its highest point?
- What are pacemaker cells?
- What are gap junctions?
- What is the bundle of His? What are the Purkinje fibers?
- How does the autonomous nervous system control the heartbeat?
- Why does bulk flow occur from blood to tissues in the first part of the capillary bed, but from tissue to blood in the second half of the capillary bed?
- How does blood in the veins go back to the heart?
- Which organ releases vasopressin? What does vasopressin do?
- Does the release of vasopressin occur when the blood pressure drops suddenly, or when it rises suddenly?
- What are stretch sensors? What is their role? Where are they located?
- What are the mechanisms to restore blood pressure after a sudden rise?
- What is renin? What is angiotensin? What are their roles?