Course objective	Geisel competency	Course Objective
1	1a	Describe the physical arrangement and roles of the various components of the cardiorespiratory system.
2	1a	Explain the ionic bases for the resting membrane potential in a cardiac muscle cell and the development and propagation of an action potential across the myocardium.
3	1a	Explain the role of calcium in cardiac muscle tension development and relaxation following action potential excitation, and discuss the influences of the length-tension relationship, contractility and load upon muscle shortening.
4	1a	Explain the electrical and mechanical events of the cardiac cycle and show how muscle characteristics and cardiac geometry combine to determine cardiac pumping performance as displayed by cardiac cycle pressure-volume trajectories and ventricular function curves.
5	1a	Explain how the characteristics of vascular geometry and flowing blood determine the load upon the ventricles.
6	1a	Describe the manner in which tissue perfusion is regulated at a local level, how materials are exchanged in the microcirculation, and how specific tissue beds differ in their local regulation responses.
7	1a	Explain the short- and long-term regulation of arterial blood pressure under normal conditions and during conditions posed by gravity, blood loss, ventricular failure and other stresses.
8	1a	Describe the static and dynamic force requirements, produced by respiratory muscles or mechanical assistance, to produce gas flow in airways of normal individuals and how pulmonary disease affects these.
9	1a	Explain the fundamental principles of convective transport and gas exchange between alveolar air and pulmonary capillary blood, and the exchange in tissues following circulatory transport.
10	1a	Discuss the central control of breathing and the afferent and efferent nerves involved.
11	1a	Describe the changes in circulation and respiration at birth.
12	1a	Describe cardiorespiratory responses and adaptations to exercise.
13	1a,4e	Discuss the impact of cardiorespiratory disease on well-being and the quality of life.
14	3f,3h	Communicate effectively with fellow students and faculty regarding principles of cardiorespiratory physiology.
15	4b	Meet professional responsibilities by providing thoughtful evaluations of course activities.