

COURSE OUTLINE

CARD-103

Physical Principles of Medicine

3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

This course encompasses the physical principles and mathematical equations specifically applicable to the field of cardiovascular technology. The course includes studies in using mathematic formulas, chemistry and physics to evaluate the hemodynamics of the cardiovascular system. Prerequisite: PHYS-101 or equivalents and appropriate score on Math Placement exam or eligible to enroll in MATH-070. (3 hours weekly)

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Use mathematical equations to calculate and analyze the hemodynamics of the cardiovascular system.
2. Correlate the hemodynamic pressures with the phases of the cardiac cycle.
3. Define, calculate and state the clinical application of Poiseuille's Law, the Law of LaPlace and the Bernouli Effect as used in the evaluation of the cardiovascular system.
4. Define the clinical relationships of pressure, pressure gradients and resistance within the cardiovascular system.
5. Describe the types, components and operation of fluid-filled monitoring systems.
6. Describe the indications, limitations and complications of invasive hemodynamic monitoring.
7. Assess the hemodynamic parameters as they relate to the pathologic condition, ie: sepsis, shock, organ failure, etc.
8. Describe the etiology and clinical presentation of the pathologic conditions.
9. Describe the special considerations relative to monitoring the pediatric patient.
10. Evaluate the arterial oxygen level through pulse oximetry, saturation, and blood gas analysis.

Major Topics

- I. Cardiovascular anatomy, physiology, and assessment techniques
 - A. Clinical applications of hemodynamic measurements
 - B. Pulmonary and cardiovascular A&P
- II. Acid-Base Disturbance

- III. Hemodynamic monitoring
 - A. Hemodynamic Waveforms
 - B. Normal Waveform Analysis

- IV. Hemodynamic Calculations
 - A. Cardiac Output Determination
 - B. Valve Area Calculation
 - C. Shunt Calculation

- V. Care for critically ill patients
 - A. Evaluate hemodynamic variations as they relate to various cardiovascular disease processes
 - B. Monitoring the pediatric patient

Course Requirements

Grading/Exams:

Grading procedures will be determined by the individual faculty member, but will include the following:

Final grades will be calculated on the basis of exams, class participation, and a class presentation. Specific writing assignments will be determined by the faculty member, but will include at least 1,000 words.

Other Course Requirements

This course is a Cardiovascular core course. Successful completion of this course requires that the student maintain a C grade or better to remain in the program.