

# Minnesota State College Southeast

## **BMET 2223: Biomedical Equipment I**

### **A. COURSE DESCRIPTION**

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

BMET 2221 - Introduction to Biomedical Equipment (Minimum grade: 3.0 GPA Equivalent)

Corequisites: None

MnTC Goals: None

This course focuses on biomedical technology as it applies to the respiratory and nervous system. Biomedical instrumentation and equipment utilized in the following areas will include: respiratory therapy, measuring brain function, intensive care monitoring, operating rooms, medical laboratory, and ultrasonography. (Prerequisites: BMET 2221 Introduction to Biomedical Equipment) (3 credits: 2 lecture/1 lab)

**B. COURSE EFFECTIVE DATES:** 07/01/2010 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

#### **D. LEARNING OUTCOMES (General)**

1. List the principle pulmonary parameters measured (capacities such as vital, functional, inspiratory,
2. Describe the various respiratory transducers
3. List the instruments used with the respiratory system (spirometers, apnea monitor, etc.)
4. Describe the function of the instruments used in the respiratory system
5. Define the various volumes measured (Tidal, inspiratory reserve, expiratory, reserve)
6. Describe the operation of adult and pediatric ventilators
7. State the maintenance procedures for the following medical lab instruments: Blood Gas Analyzers, Co-Oximeters, Centrifuges, Microscopes, Cell Counters, Chemistry Analyzers
8. Describe the function and purpose of the special care units in the hospital
9. List the instrument systems used in ICU and CCU
10. Troubleshoot common problems associated with equipment used in ICU and CCU (e.g.: bedside monitors, cardiotachometers, alarms, lead fault indicators, central monitoring
11. List the functions of equipment used in Operating Room
12. Describe the functions of the Operating Room
13. Describe the protocols involved in working in the Operating Room (dress code, cleanliness and attitude)
14. List the duties of the personnel employed in the Operating Room (e.g.: the nursing staff, biomedical technician, surgeon, etc.)
15. List the special equipment used in the OR
16. List the safety precautions observed in the OR
17. List the different methods of sterilization
18. Define terms used in surgery
19. Describe applications of medical diagnostic ultrasound (cardiology, ob/gyn, general radiology etc.)
20. Explain the purpose of ultrasound in medical applications
21. Define the terms associated with ultrasound (e.g.: wavelength, acoustics, reflection, refraction, piezo effects, echocardiography, doppler effects)
22. Explain the physics of sound waves w.r.t., wavelength, velocity, period, frequency, reflection, refraction and resonator
23. Explain the biological effects of ultrasound
24. Describe the operation of the instruments used in delivering ultrasound (e.g.: the Doppler flow meter, blood pressure monitor, fetal monitor, echocardiography and echoencephalography)
25. Describe the operation ultrasound instruments
26. List safety precautions regarding the maintenance and use of ultrasound instruments
27. Describe the types of transducers used in medical diagnostic ultrasound
28. Distinguish between "sector" scans and "linear" scans
29. Define "dead zone" as it applies to ultrasound
30. Distinguish between "Spectral Doppler" and "Color Flow Doppler"

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted