

# Dakota County Technical College

## **BMET 1225: Biomedical Instrumentation I**

### **A. COURSE DESCRIPTION**

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course studies the various technologies used in the medical care field. Areas of study will cover the use of various test equipment, performing preventive maintenance and the use of testing equipment for maintaining proper operation. Students will also learn to read schematics and following instructions in service manuals for performing test and maintenance. Each class will have a lecture component on a specific type of instrumentation following the syllabus. Prerequisites: BMET1112, BMET1123, and BMET1110

**B. COURSE EFFECTIVE DATES:** 01/11/2010 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

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

1. Describe ground referenced and isolated power systems
2. Describe reflection, refraction, diffraction and scattering phenomena
3. Discuss the physics of ultrasound
4. Explain function of centrifuges
5. Inspect and evaluate the performance of ultrasonic instruments
6. List factors that affect biological interaction with ultrasound
7. List testing requirements for portable plug connected devices
8. List testing requirements for receptacles and wiring
9. Operate a ultrasonic transducer
10. Operate and maintain hemodialysis machines
11. Operate centrifuges
12. Perform all experiments in the LK-upp Experiment manual
13. State the purpose, uses and operation of auto analyzers
14. State the purpose, uses and operation of blood cell counters
15. State the purpose, uses and operation of blood gas analyzers (pH, PO<sub>2</sub> and PCO<sub>2</sub>)
16. State the purpose, uses and operation of chromatographs
17. State the purpose, uses and operation of colorimeters
18. State the purpose, uses and operation of densitometers
19. State the purpose, uses and operation of photometers
20. State the purpose, uses and operation of spectrophotometer
21. Classify lasers by ANSI and LIA safety standards
22. Demonstrate charging procedures for common batteries
23. Describe a neural network and how it enhances medical images
24. Describe fiber-optics loss modes
25. Describe interfacing units
26. Describe principles of electro surgery machines
27. Describe procedures for safely handling electro surgery machines
28. Describe the Internet and how it is used in health care
29. Describe the expert system
30. Describe the principles of a medical cathode ray oscilloscope
31. Describe the principles of a recording potentiometer
32. Describe the principles of servomechanism recorders
33. Describe the types of batteries used in medical equipment
34. Describe types of lasers
35. Draw a DAS in laboratory instrumentation
36. Draw circuits used to generate electro surgery waveforms
37. List and describe types of writing systems in mechanical recorders
38. List the health effects of x-ray and nuclear radiation exposure
39. List the properties and measurements of x-rays
40. List uses of diagnostic and therapeutic x-ray and nuclear medicine equipment
41. Maintain battery operated equipment
42. Set up and test a monitoring station
43. State the limitations of batteries
44. Test NIBP units

45. Test a defibrillator
46. Test an ECG
47. Test an infusion pump
48. Test electro surgery machines

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted