

Revised: November, 2002

## YORK TECHNICAL COLLEGE COURSE SYLLABUS

COURSE PREFIX/NO: BMT 233  
COURSE TITLE: Medical Equipment and Repair  
LEC HRS/WEEK: 1  
LAB HRS/WEEK: 6  
CREDIT HRS/WEEK: 3

[DL ATTENDANCE/  
VA STATEMENT](#)

### TEXTBOOK INFORMATION

#### COURSE DESCRIPTION:

This course covers the application of the performance analyzer, tester and simulator for troubleshooting and calibration of medical equipment.

#### COURSE COMPETENCIES:

Upon successful completion of this course the student should be able to;

#### Module A: Hospital Policies and Procedures

1. Identify the policies and procedures for a hospital.
2. Identify the appropriate response to the hospital codes: Code Red, Code Blue, etc.
3. Identify the responsibilities of a biomedical technician.

#### Module B: Basic Human Anatomy and Physiology

4. Explain the chemical processes that take place within the human body.
5. Explain the mechanical actions of the cardiovascular system.
6. Identify the components of a EKG tracing.
7. Explain the respiratory system and its mechanical processes.
8. Identify common medical terminology.

#### Module C: Equipment Calibration and Repair

9. Demonstrate appropriate shipping procedures for sending equipment away to be repaired.
10. Calibrate and repair:
  - a. Defibrillators
  - b. Bloodwarmers
  - c. Electrosurgical Units (ESUs)
  - d. Cardiovascular Monitoring
  - e. Infusion Pumps
  - f. Blood Pressure Machines
  - g. Feeding Pumps
  - h. Temperature Probes
  - i. Oxygen Analyzers (SPO<sub>2</sub>) Systems
  - j. X-ray equipment (limited)

#### MINIMAL STANDARD/PERFORMANACE OBJECTIVES:

#### Module A: Hospital Policies and Procedures

1. Given instructions and lists of hospital policies and procedures, the student will identify the policies and procedures for a hospital with 80% accuracy.
2. Given codes and related instructions the student will identify the appropriate response to the hospital codes: Code Red, Code Blue, etc. with 95% accuracy.

3. Given lectures and lists the student will identify the responsibilities of a biomedical technician with 85% accuracy.
4. Given instructions and guidance, the student *will adhere to all hospital policies and procedures established by the training hospital* to the satisfaction of his immediate supervisor.

#### Module B: Basic Human Anatomy and Physiology

5. Given lectures and texts the student will explain the chemical processes that take place within the human body to the satisfaction of the instructor.
6. Given lectures and texts the student will explain the mechanical actions of the cardiovascular system to the satisfaction of the instructor.
7. Given lectures and texts the student will identify the components of a EKG tracing with 85% accuracy.
8. Given lectures and texts the student will explain the respiratory system and its mechanical processes to the satisfaction of the instructor.
9. Given lectures and texts the student will identify common medical terminology with 90% accuracy.

#### Module C: Equipment Calibration and Repair

10. Given instructions and guidance, the student will demonstrate appropriate shipping procedures for sending equipment away to be repaired to the satisfaction of the instructor.
11. Given instructions and guidance, the student will calibrate and repair the following equipment to the satisfaction of instructor.
 

a. Defibrillators	f. Blood Pressure Machines
b. Bloodwarmers	g. Feeding Pumps
c. Electrosurgical Units (ESUs)	h. Temperature Probes
d. Cardiovascular Monitoring Systems	i. Oxygen Analyzers (SPO <sub>2</sub> )
e. Infusion Pumps	j. X-ray equipment (limited)

### COURSE REQUIREMENTS

Students are responsible for attaining competencies through completion of the following course requirements.

### COURSE INFORMATION

This course is a combination of online (WebCT) instruction and hospital internship. The student is expected to review the online material and respond as required by the instructor. The student will be given a CD ROM that will be accessed by WebCT. This CD contains the PowerPoint lectures covering the competencies. The student is expected to master the information to the satisfaction of the instructor. The student is expected to report weekly progress to the instructor via e-mail, bulletin board, phone call or in person. Failure to do so may result in termination of enrollment in course.

### ATTENDANCE:

The student must attend complete a minimum of 100 hours of biomedical engineering technology practicum (lab) under the direct supervision of a qualified biomedical engineer or technician at a local hospital. However, the student must successfully complete all competencies before credit for the course will be issued. The time schedule will be established at the beginning of the practicum. It is the student's responsibility to call the immediate hospital supervisor in the case of tardiness or absence. The student should also call the instructor responsible for the course in case of absence. Failure to report an absence may result in immediate dismissal. The hospital supervisor maintains the right to dismiss a student if too many absences or late arrivals occur.

**ACADEMIC INTEGRITY:**

Students are bound by the policies and procedures of the current York Technical College Handbook. Any student violating the policy will be subject to academic discipline.

**HOSPITAL INTEGRITY:**

Students are bound by the policies and procedures established by the hospital in which they are training. Any student violating that policy will be subject to discipline according to those policies and may also be subject to academic discipline by The College.

**EVALUATION**

**STRATEGIES/GRADING** The grading scale will be:

90 – 100	A	Exception Work
80-89	B	Meets Requirements
70-79	C	Needs More Training
0-69	F	Does Not Meet Requirements

Final Grades will be determined as follows:

Module A: Hospital Policies and Procedures 30%  
Module B: Basic Human Anatomy and Physiology 10%  
Module C: Equipment Calibration and Repair 60%

**NOTE!** Failure to adhere to hospital policies and procedures may result in a grade of “F” regardless of other scores.

**ENTRY LEVEL SKILLS:**

Students must be a graduate of (or within one semester of graduating from) the Electronic Engineering Technology program with a minimum GPA of 2.5 and be recommended by a faculty member.

**PRE-EQUISITES:**

None

**CO-EQUISITES:**

None

**METHOD OF INSTRUCTION:**

Modules A and B will be learned via in class lectures, hospital orientations and/or on-line instruction. Module C will be via a practicum at a local hospital under the direct supervision of a qualified biomedical equipment engineer or technician. Tests will be oral or pencil and paper either in class or in the testing center. Students must make time to attend the hospital orientation.

## TOPIC/CONTENT OUTLINE:

### Module A: Hospital Policies and Procedures

1. Hospital Policies and Procedures
2. Personal and Patient Safety
3. Hospital Codes
4. Biomedical Technician Responsibilities

### Module B: Basic Human Anatomy and Physiology

1. List the key elements found in the human body.
2. Discuss the chemistry of carbon compounds
3. Define the following processes: diffusion, osmosis, filtration, and circulation
4. Describe the process that produces bio-electricity
5. Identify the purpose of the cardiovascular system
6. Discuss the flow of blood through the heart.
7. Explain the mechanical actions that produce normal heart sounds
8. Explain what makes the heart beat.
9. Identify the normal components of an EKG tracing.
10. Identify the waveforms of a normal sinus rhythm.
11. Identify the abnormalities commonly found during cardiac monitoring: sixty-second cycling, muscle artifact, wandering baseline, and false high and low rate alarms.
12. Name the general phases of respiration
13. Distinguish between inspiration and expiration by describing the mechanics of each.
14. Differentiate between normal ventilation and mechanical ventilation.
15. Identify the normal pH of the human body.
16. Explain the function of the buffer system in the body.
17. Identify correlation between biologic systems and common mechanical systems.
18. Identify common medical terminology.

### Module C: Equipment Calibration and Repair

1. Defibrillators
2. Bloodwarmers
3. Electrosurgical Units (ESUs)
4. Centrifuge
5. Cell Washer
6. Monitoring Systems
7. Blanket Rolls
8. Care Plus Incubator
9. Infusion Pumps
10. Blood Pressure Machines
11. Feeding Pumps
12. Temperature Probes
13. Oxygen Analyzers (SPO2)
14. X-ray equipment (limited)
15. Shipping Procedures