
COURSE PREFIX NO.: SUR 130
COURSE TITLE: Biomedical Science for the Surgical Technologist
LECTURE HRS/WK: 1.0
LAB HRS/WK: 0.0
CREDITS HRS/SEM: 1.0

[Distance Learning Attendance/VA Statement](#)
[Textbook Information](#)

COURSE DESCRIPTION

This course includes basis principles of electricity, physics, and robotics as they relate to safe patient care practices in the operating room.

COURSE COMPETENCIES

MODULE 1: BIOMECHANICS AND COMPUTER TECHNOLOGY

1. Describe the nature of the atom
2. Describe the elements of motion
3. Discuss different types of electromagnetic energy
4. List the properties of waves
5. Describe how energy is derived from free electrons moving along a conductive path
6. Discuss alternating and direct current
7. Describe the relationship between a lens and light rays
8. Describe conduction, convection, and radiation as it is related to patient safety
9. Discuss the importance of data security
10. Perform basic computer tasks

MODULE 2: ENERGY SOURCES INSURGERY

1. Describe how different energy sources are related to the electromagnetic spectrum
2. Describe the use and components of electrosurgery
3. Discuss the safe use of the patient return electrode
4. Distinguish between monopolar and bipolar circuits used in electrosurgery
5. Discuss vessel sealing using radiofrequency energy
6. List the primary hazards of electrosurgery and describe how to prevent accidents
7. Distinguish between capacitive coupling and direct coupling
8. Describe how ultrasonic waves are used to perform surgery
9. Describe how lasers are used in surgery
10. Recognize different types of laser media
11. Discuss safety precautions used during laser surgery

MODULE 3: MINIMALLY INVASIVE ENDOSCOPIC AND ROBOTIC-ASSISTED SURGERY

1. Discuss the advantages and constraints of minimally invasive surgery (MIS)
2. Describe the preparation of the patient for MIS
3. Describe the function of each component of the imaging equipment used in MIS
4. Discuss the care of a rigid endoscope
5. Describe the trocar-cannula system used in all MIS
6. Describe the surgical technique used for unsufflation in laparoscopy
7. List the risks associated with insufflations
8. Describe the specific electrosurgical risks of direct and capacitative coupling
9. Explain how specimens are collected and retrieved during MIS
10. Describe the structure and function of a flexible endoscope
11. Discuss the proper protocol for processing rigid and flexible endoscopes
12. Describe the principles of robotic surgery
13. Discuss the concept of Cartesian geometry as it applies to robot design
14. Describe robotic movements and classification
15. Discuss training resources for robotic surgery
16. List the three main components of robotic surgery and describe their function
17. Identify possible methods used for decontamination and reprocessing robotic instruments
18. Describe the roles of team members during robotic surgery

MINIMAL STANDARDS

The student must **earn a satisfactory final grade (80 or higher)** in this course to continue in the Surgical Technology Program.

COURSE REQUIREMENTS

In order to successfully complete SUR 130, the student is required to fulfill the following requirements:

1. Complete all reading assignments prior to online class sessions.
2. Successfully complete all assignments and competency-based exams.

EVALUATION STRATEGIES

Written Exams

There will be an exam for each of the 3 Modules. All tests will be available in D2L. The exam can be constructed with multiple choice questions, matching, fill-in-the-blank, essay (short essays).

Methods of Instruction

This course is delivered online and is asynchronous. Methods of instruction include course management system (D2L); discussion boards; instructor-developed PowerPoint presentations; YouTube video clips; online reference resources; discussions; email; and textbook supplements.

GRADING PROCEDURES

Grades will be based on performance on written competency-based tests, assigned course work. Exam material will come from textbook, lecture material, handouts, and online discussion.

Evaluation of performance

- Competency-Based Exams = 75%
- Assigned Course Work= 25%

Grading Scale

93 - 100	A
85 - 92	B
80 - 84	C
75 - 79	D
Below 75	F

ATTENDANCE

SUR 130 is an online course. Asynchronous learning experiences happen throughout the course and do not require student participation at a scheduled time. However, students must attend class as online courses are no different from traditional classroom courses in this regard. Online students are subject to the same attendance policy and procedures as traditional students. Student attendance in online courses is defined as active participation in the course. Online courses will, at a minimum, have weekly mechanisms for student participation, which can be documented by any or all of the following methods:

- Completion of exams
- Submission/completion of assignments (through submission of completed course work or discussion boards)
- Communication with the instructor

Students who fail to maintain active participation will be processed using the policies stated in the *York Technical College Catalog & Handbook*.

ACADEMIC INTEGRITY

The policies stated in the *York Technical College Catalog & Handbook* and the *Surgical Technology Handbook* will be enforced.

ENTRY-LEVEL SKILLS

A student entering SUR 130 should have appropriate entrance scores for the Surgical Technology Program and the willingness to read, comprehend, and communicate effectively in an online format.

PREREQUISITES: None

CO-REQUISITES: SUR 101, SUR 102

Disabilities Statement: Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Offices (SR) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.

Revised: 10/10