

**Clemson University - Center for Corporate Learning****1 North Main Street, 7th Floor,****Greenville, SC 29601****<http://www.clemson.edu/online/>****Contact: Juanita Durham | 864.656.3984 | jdrhm@clemson.edu****EKG Technician**

Format: Self-Pace Online / eLearning
Program Duration: 6 Months
Course Contact Hours: 375

The EKG Technician Profession

EKG technicians are in demand! EKG technicians work in physician's offices, hospitals, clinics, and other healthcare facilities and organizations. EKG technicians also work for insurance companies to provide data for health and life insurance policies. Like other growing healthcare professions, the demand for EKG technicians is expected to continue to grow substantially. The U.S. Bureau of Labor Statistics (BLS) predicted that the decade 2014-2024 could see employment of all cardiovascular technicians and technologists increase by 22%.

The EKG Technician Program

This EKG Technician Program prepares students to perform EKGs. This course will include information on anatomy and physiology of the heart, medical disease processes, medical terminology, medical ethics, legal aspects of patient contact, electrocardiography and stress testing. A highly interactive course! This EKG Technician program prepares students to function as EKG technicians. This course covers the following key areas and topics:

- Detailed anatomy and physiology of the heart
- Medical disease processes and terminology
- Medical ethics and legal aspects of patient contact
- Electrocardiography and echocardiography
- An introduction to the components, function, and proper use of the EKG machine
- The normal anatomy of the chest wall for proper lead placement
- 12-lead placement and other practices

Education and National Certifications

- EKG Technicians should have or be pursuing a high school diploma or GED.
- There are no state approval and/or state requirements associated with this program.
- National Certification:
 - ASPT Electrocardiograph (EKG) Technician exam
 - NHA Certified EKG Technician exam

EKG Technician Detailed Course Information:

- Apply the basic electrophysiologic principles of cardiac conduction to the anatomy and physiology of the body
- Identify proper placement of leads to ensure an accurate and consistent EKG reading
- Evaluate various EKG rhythm strips following established normal criteria for each of the wave forms and intervals
- Analyze a variety of EKG rhythm strips, identifying rate, rhythm and intervals
- Analyze a variety of EKG rhythm strips for common dysrhythmias
- Apply an understanding of the technical aspects of the EKG machine to the correct use of the machine and interpretation of artifacts
- Describe the functions, associated terminology, types, and rhythm strips of pacemakers
- Describe diagnostic electrocardiography in terms of goals, types, procedures, indications, and contraindications
- Explain how to interpret a 12-lead EKG strip
- Explain myocardial infarction in terms of physiology, symptoms, and EKG interpretation
- Describe common cardiac medications

EKG Technician Detailed Program Objectives

CORONARY ANATOMY AND PHYSIOLOGY

- Describe the gross anatomy of the heart including the muscle and cellular structure, atria, ventricles, and valves
- Trace the flow of blood through the heart and the cardiovascular system
- Distinguish between the phases of the cardiac cycle including the events that occur during each phase
- Identify the effects diastole and systole have on the EKG tracing
- Describe the interaction between the nervous system and the heart

ELECTROPHYSIOLOGY

- Describe the gross anatomy of the heart including the muscle and cellular structure, atria, ventricles, and valves
- Describe the interaction between the nervous system and the heart
- Distinguish between the terms polarized, depolarized and repolarized as they relate to contraction and relaxation
- Identify the phases of an action potential
- Explain the P wave, QRS complex, T wave, and U wave as found in an EKG tracing
- Distinguish between the absolute and relative refractory periods including the implications of each period
- Properly label all waves and complexes on a rhythm strip
- Explain the delineations found on EKG paper
- Identify the waves in a variety of QRS complexes

LEAD MORPHOLOGY AND PLACEMENT

- Distinguish between an electrocardiograph and an electrocardiogram
- Identify the proper placement of bipolar leads and augmented leads
- Explain the effect augmentation has on an EKG
- Explain Einthoven's law and Einthoven's triangle
- Identify the leads composing the hexiaxial diagram

- Identify the proper location of the precordial leads
- Explain the electrocardiographic truths
- Describe the normal QRS complex deflections in each of the 12 leads on an EKG

THE TECHNICAL ASPECTS OF THE EKG

- Describe the control features of an EKG machine
- Differentiate between macroshock and microshock
- Describe the different kinds of artifacts found on a rhythm strip
- Correctly troubleshoot artifacts found on a rhythm strip
- Identify rhythms that can be mimicked by artifact
- Differentiate between artifacts and arrhythmia

CALCULATING THE HEART RATE

- Determine a patient's heart rate
- Calculate the heart rate on a variety of rhythm strips using a variety of methods
- Differentiate between the three types of rhythm regularity
- Employ the five steps to interpret a variety of rhythms
- Correctly identify a variety of rhythms
- Determine what kind of heart rate to calculate for different kinds of rhythm regularity

HOW TO INTERPRET A RHYTHM STRIP

- Determine a patient's heart rate
- Calculate the heart rate on a variety of rhythm strips using a variety of methods
- Differentiate between the three types of rhythm regularity
- Employ the five steps to interpret a variety of rhythms
- Correctly identify a variety of rhythms
- Determine what kind of heart rate to calculate for different kinds of rhythm regularity

A REVIEW OF RHYTHMS ORIGINATING FROM THE SINUS NODE

- State the criteria for each of the sinus rhythms
- Correctly interpret a variety of sinus rhythms on single and double-lead strips
- Identify the adverse effects for each of the sinus arrhythmias
- Describe the possible treatment for the sinus arrhythmias
- Correctly identify a variety of rhythms

A REVIEW OF RHYTHMS ORIGINATING FROM THE ATRIA

- State the criteria for each of the atrial arrhythmias
- Correctly identify a variety of rhythms

A REVIEW OF RHYTHMS ORIGINATING IN THE AV JUNCTION

- Differentiate between high, low, and midjunctional conduction locations
- State the criteria for each of the junctional arrhythmias
- Correctly interpret a variety of junctional arrhythmias
- Identify the adverse effects of each type of junctional rhythm
- Describe the possible treatment for each type of junctional arrhythmia
- Correctly identify a variety of rhythms

RHYTHMS ORIGINATING ON THE VENTRICLES

- Describe the conduction that occurs in ventricular rhythms
- State the criteria for each of the ventricular arrhythmias
- Correctly interpret a variety of ventricular arrhythmias

- Identify the adverse effects of each type of ventricular rhythm
- Describe the possible treatment for each type of ventricular arrhythmia
- Correctly identify a variety of rhythms

AV BLOCKS

- Identify the three degrees of AV block
- State the criteria for each type of AV block
- Correctly identify each type of AV block
- Identify the adverse effects of each type of AV block
- Describe the possible treatment for each type of AV block
- Correctly identify a variety of rhythms

PERFORMING RHYTHMS PRACTICE STRIPS

- Calculate the heart rate on a variety of rhythm strips using a variety of methods
- Differentiate between the three types of rhythm regularity
- Employ the five steps to interpret a variety of rhythms
- Correctly interpret a variety of sinus rhythms on single and double-lead strips
- Correctly interpret a variety of atrial arrhythmias
- Differentiate between high, low, and midjunctional conduction locations
- Correctly interpret a variety of junctional arrhythmias
- Correctly interpret a variety of ventricular arrhythmias
- Correctly identify each type of AV block
- Correctly identify a variety of rhythms
- Determine what kind of heart rate to calculate for different kinds of rhythm regularity

ARTIFICIAL PACEMAKERS

- Describe the primary function of a pacemaker
- Identify the indications for a pacemaker
- Define selected terms associated with pacemakers
- Describe the types of temporary pacemakers
- Identify what each letter of a pacemaker code means
- Identify pacemaker rhythms as being either VVI or DDD
- Identify the different kinds of pacemaker malfunctions

DIAGNOSTIC ELECTROCARDIOGRAPHY

- State the goal of stress testing
- Describe the indications and contraindications (relative and absolute) for stress testing
- Describe how to calculate target heart rate
- Describe how an exercise stress test and pharmacological stress test are conducted
- Describe the three most commonly used protocols for treadmill exercise testing
- Explain the conditions in which a stress test may be terminated
- Identify the normal signs and symptoms during the stress test as well as EKG changes that may indicate a positive or negative stress test
- Explain the relationship between specificity and sensitivity as it relates to a stress test
- Identify the indications and contraindications for Holter monitoring
- Identify the artifacts associated with Holter monitoring
- Indicate the conditions in which Holter results may be determined positive or negative

HOW TO INTERPRET A 12-LEAD EKG

- Identify the six steps necessary to interpret a 12-lead EKG
- Determine if a right or left bundle branch block exists
- Identify right and left ventricular hypertrophy
- Determine if any miscellaneous effects are present

MYOCARDIAL INFARCTION

- Describe the classic symptoms of a myocardial infarction
- Describe the difference between Q wave myocardial infarction (MI) and non-Q wave MI
- Describe what EKG changes are associated with ischemia, injury, and infarction
- Describe the different kinds of ST segment abnormalities and explain what each implies
- Describe the different T wave abnormalities and explain what each implies
- Describe how a significant Q wave differs from a normal Q wave
- Describe normal R wave progression
- Identify the transition zone in a variety of EKGs

CARDIAC MEDICATIONS AND ELECTRICAL THERAPY

- Describe the effect of each class of antiarrhythmic medication on the action potential
- Give examples of each class of antiarrhythmic medications
- Describe emergency medications including the mode of action of each
- Describe the two types of electrical therapy