Clemson University
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Education & Training Plan
EKG Technician (Spanish Version) Certification Program with Externship

Student Full Name: _____

Start Date: _____ End Date: _____

Program includes National Certification & an Externship Opportunity
Mentor Supported

Clemson University Program with Externship

Course Code:	CLEM-EK 05-SPNSH
Program Duration:	4 Months
Course Contact Hours:	375
Student Tuition:	$3,000.00

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. Similar to other growing healthcare professions, the demand for EKG technicians is expected to continue to grow substantially. Approximately 25% more EKG technician jobs will be available by the year 2030.

The EKG Technician Program

This EKG Technician Program prepares students to perform EKG's. 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.
- National Certification exam that is available to students who successfully complete this program:
    - **National Healthcareer Association (NHA) Certified EKG Technician (CET) exam**

EKG Technician Detailed Course Information:

- Role of the EKG technician
- Function of the EKG department in a variety of settings (hospital, clinic, office, etc.)
- Medical terminology related to electrocardiography
- Care and safety of patients including medical and legal aspects of patient care
- Anatomy and physiology of the cardiovascular system
- Electrophysiology, the conduction system of the heart, and the cardiac cycle
- Circulation of blood through the heart and vessels
- Lead placement for 12-lead electrocardiography
- Basic EKG interpretation of normal rhythms and arrhythmias
- EKG troubleshooting including recognizing artifacts
- Waves and measurements
- EKG strip analysis (P, Q, R, S, T wave-form interpretation)
- Identification of rhythms using the 12-lead EKG
- Pacemakers
- Holter monitoring and the echocardiogram

National Certification

Students who complete the Clemson University EKG Technician (Spanish Version) program will be prepared to sit for the National Healthcareer Association (NHA) Certified EKG Technician (CET) exam national certification exam(s). In order to work as a EKG Technician (Spanish Version), many states nationwide are requiring that learners achieve national certification prior to working in that state. Students who complete this program are encouraged to complete the practical/clinical externship option with their program. This comprehensive program is designed to prepare students to sit for National Healthcareer Association (NHA) Certified EKG Technician (CET) exam exam(s). Students who complete this program can and do sit for the National Healthcareer Association (NHA) Certified EKG Technician (CET) exam national certification exam(s) and are qualified, eligible and prepared to do so.

Externship / Hands on Training / Practicum

Although not a requirement, once students complete the program, they have the ability to participate in an externship and/or hands on practicum so as to practice the skills necessary to perform the job requirements of a professional in this field. Students will be assisted with completing a resume and/or other requirements necessary to work in this field. All students who complete this program are eligible to participate in an externship and will be placed with a participating organization near their location. The institution works with national organizations and has the ability to place students in externship opportunities nationwide.

Clemson University contact: If students have any questions regarding this program including national certification and externships **, they should call Salley Ouellette of Clemson University at | (864) 656-2200 or via email at palmer4@clemson.edu**

Note : No refunds can be issued after the start date published in your Financial Award document.

About Clemson University!

Clemson Online, a unit reporting directly to the Provost, works closely with leadership teams across the University to develop, market, and deliver top-quality courses and programs in blended and online formats. The office provides vision, leadership, coordination, and expertise in support of faculty design, delivery, and evaluation of technology-enhanced, blended, and fully online courses and instructional materials. Dynamic, transformative, and unique eLearning opportunities characterize Clemson's approach to online teaching and learning.

Our Mission: Clemson Online provides strategic leadership for online education, emphasizing innovative teaching and superior learning outcomes to maximize student success in 21st-century academic and professional contexts.

Our Vision: Clemson Online will define the public web-grant university through measurable achievements in online education, research, and service. The office is committed to pursuing strategic opportunities, providing supportive resources, promoting superior educational quality, and ensuring faculty involvement and responsibility in shaping Clemson's online future.

Clemson University and Pearson Education

Clemson University's eLearning programs were developed in partnership with Pearson Education to produce the highest quality, best-in-class content and delivery necessary to enhance the overall student learning experience, boost understanding and ensure retention. Pearson Education is the premier content and learning company in North America offering solutions to the higher education and career training divisions of colleges and universities across the country aimed at driving quality education programs to ensure student success. Please visit us at **www.pearson.com** .

About Pearson Education

Welcome to Pearson. We have a simple mission: to help people make more of their lives through learning. We are the world's leading learning company, with 40,000 employees in more than 80 countries helping people of all ages to make measurable progress in their lives. We provide a range of education products and services to institutions, governments and direct to individual learners, that help people everywhere aim higher and fulfil their true potential. Our commitment to them requires a holistic approach to education. It begins by using research to understand what sort of learning works best, it continues by bringing together people and organizations to develop ideas, and it comes back round by measuring the outcomes of our products.

EKG Technician Program Detailed 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

TECHNICAL ASPECTS OF THE EKG

- Describe the control features of an EKG machine
- Differentiate between macroshock and microschock
- 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 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

RHYTHMS ORIGINATING IN 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

RHYTHMS ORIGINATING IN THE ATRIA

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

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 IN 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

RHYTHM 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

Note: This program can be completed in 4 months. However, students will have online access to this program for a 24-month period.

MICROSOFT OFFICE

- Module Use an integrated software package, specifically the applications included in the Microsoft Office suite
- Demonstrate marketable skills for enhanced employment opportunities
- Describe proper computer techniques for designing and producing various types of documents
- Demonstrate the common commands & techniques used in Windows desktop
- List the meaning of basic PC acronyms like MHz, MB, KB, HD and RAM
- Use WordPad and MSWord to create various types of documents
- Create headings and titles with Word Art
- Create and format spreadsheets, including the use of mathematical formulas
- Demonstrate a working knowledge of computer database functions, including putting, processing, querying and outputting data
- Define computer terminology in definition matching quizzes
- Use the Windows Paint program to alter graphics
- Use a presentation application to create a presentation with both text and graphics
- Copy data from one MS Office application to another application in the suite
- Use e-mail and the Internet to send Word and Excel file attachments
- Demonstrate how to use the Windows Taskbar and Windows Tooltips
- Explain how copyright laws pertain to data and graphics posted on the Internet
- Take the college computer competency test after course completion
- Follow oral and written directions and complete assignments when working under time limitations

Note: Although the Microsoft Office Module is not required to successfully complete this program, students interested in pursuing free Microsoft MOS certification may want to consider completing this Microsoft Office Module at no additional cost.

System Requirements:

Windows Users:

- Windows 8, 7, XP or Vista
- 56K modem or higher
- Soundcard & Speakers
- Firefox, Chrome or Microsoft Internet Explorer

Mac OS User:

- Mac OS X or higher (in classic mode)
- 56K modem or higher
- Soundcard & Speakers
- Apple Safari

iPad Users:

- Due to Flash limitations, eLearning programs are NOT compatible with iPads

Screen Resolution:

- We recommend setting your screen resolution to 1024 x 768 pixels.

Browser Requirements:

- System will support the two latest releases of each browser. When using older versions of a browser, users risk running into problems with the course software.
- Windows Users: Mozilla Firefox, Google Chrome, Microsoft Internet Explorer
- Mac OS Users: Safari, Google Chrome, Mozilla Firefox

Suggested Plug-ins:

- Flash Player
- Real Player
- Adobe Reader
- Java