

# PACS Engineers & Administrators Certification Phase II

Course Length: 2 weeks  
CEU's Awarded: 8

## INTRODUCTION

The PACS Engineers & Administrators Certification Phase II course will teach the in-depth technical interface and integration skills necessary to troubleshoot and solve any of today's toughest system administrative problems. Students will learn the in-depth troubleshooting techniques of digital imaging systems, modalities, and information management systems such as HIS, RIS, PACS and teleradiology. Students will be able to analyze problems with non-invasive DICOM sniffing software to pinpoint the source of digital imaging problems and determine the appropriate corrective action.

## PREREQUISITES

The seasoned service professional must have a basic understanding of computer fundamentals and navigating windows operation systems and completion of PACS Engineers & Administrators Certification Phase I. Students are required to bring their own laptop.

## OBJECTIVES

Upon completion of PACS Engineers & Administrators Certification Phase II, individuals will be prepared to:

- Understand PACS system administration
- Understand and implement security policies and procedures required to protect and maintain critical medical records, including information systems and images
- Understand and troubleshoot image-quality-related DICOM problems
- Develop and implement the QA/QC program requirements of the filmless imaging department
- Pinpoint image transmission problems regardless of the manufacturer
- Perform necessary corrective action
- Determine who is to blame between OEMs when digital image problems occur eliminating costly site visits by OEM service personnel

## COURSE OUTLINE

### I. PACS Technologies

- Workflow
- Analysis
- Tools
- Issues
- CR/DR Workflow
- Administrator Workflow Mapping

### II. PACS System Administration

- Project Management
- System Maintenance
- Image and Information Management (IIM)

### III. Security and HIPAA Requirements for PACS

### IV. HIPAA Requirements for PACS

- Codes
- Identifiers
- HIPAA Implementation Zones
- HIPAA Administration

### V. Advanced DICOM

### A. DICOM Storage and Image Management

- Storage Service Class
  - Single/Multi-frame
- Storage Commitment
- MPPS: Modality Performed Procedure Step
  - MPPS Manager
  - RIS
  - PACS
  - MWL

### 4. DICOM Print

- Film Sessions
- Film Box
- Annotation Box
- Print Job
- Presentations
- LUT's

### 5. Query/Retrieve

- Query/Retrieve - FIND
  - Query/Retrieve - MOVE - GET
  - Query/Retrieve - CANCEL
- SR (Structured Reporting)
    - Simple Reporting (Basic)
    - Intermediate Reporting (Enhanced)
    - Complex Reporting (Comprehensive)
    - Key Object Note

### B. DICOM Image Quality

- Pixel Representation
- Allocated/Stored/High Bit
- Monochrome/RGB
- Signed/Unsigned

### C. Image Pixel Pipeline

- LUT (Look Up Tables)
- Modality LUT
- Masks
- VOI LUT
- Presentation LUT

### D. Workstation Configuration to Radiologist Preferences

- Customization
- Toolbars
- Hanging Protocols

### E. Grayscale Standard Display Function (GSDF)

- Calibration Methods
- Presentation State
- Overlays
- Pixel Data
- Overlay Plane

### F. Compression

- Lossy/Lossless
- JPEG
- MPEG
- RLE
- Wavelet

### G. DICOM Media

- Media Specifications
- Physical Media
- File Structure
- DICOMDIR
- Application Profiles
- CD Interchange Issues

### VI. DICOM Networking

- PDU's (Protocol Data Units)
- DICOM AE's
  - IP/Port/Subnet Mask/Default Gateway

### C. DICOM Messages

- DIMSE Commands
- Command Sets
- Data Sets
  - Tag-Length
  - VR/VM (Value Representation/Value Multiplicity)
  - Explicit/Implicit VR's
  - Decoding VR's
- Specialization and Privatization
- Proprietary DICOM

### D. DICOM Devices

- SCU/SCP (Service Class User/Service Class Provider)
- FSR/FDC/FSU

### E. Device Negotiation

- ID
- Abstract Syntax
- Transfer Syntax
- Presentation Context
- DICOM Association

### VII. DICOM Troubleshooting

#### A. Sniffers and Testing Software

- Active Test Tools
  - Configure & Troubleshoot Using DICOM Emulators
- Passive Test Tools
  - Configure & Troubleshoot Using Non-invasive DICOM Sniffers.

#### B. Interpret DICOM Logs

#### C. Evaluate DICOM Dumps

### VIII. HL7 Standard Overview

#### A. HL7 messaging

- Message Structure
- Patient Registration (ADT)
- Data Types
- Segments
- Acknowledgements
  - Original
  - Enhanced
- Error Messages
- General Order Messages

#### B. HL7 Message Profiles

#### C. HL7 Troubleshooting

#### D. Messaging Test Tools

### IX. Quality Control

- Laser Imagers
- Workstations/Viewstations

### X. IHE

- Integration Profiles
- Transactions
- Actors
- Integration Statements

PACS Engineer & Administrator Phase II Exam