

# NETWORKING, DICOM, PACS AND CAPITAL ASSET MANAGEMENT FOR MANAGERS

Course Length: 5 days  
CEUs Awarded: 4

## Introduction

Hospitals are moving quickly into a digital and filmless world of information. Innovations in technology that are providing better and faster image diagnosis are rapidly showing up in all areas of diagnostic imaging. As a manager in radiology or biomedical engineering, you need to become more familiar with the trends in computer/information networking, DICOM standards, and digital patient archiving.

This course is designed to provide hospital management, OEM managers, and maintenance providers with the in-depth knowledge necessary to start and manage a diagnostic imaging capital asset management program. It is recommended that the lead people involved in starting and implementing this program attend the same course.

The course is recommended for:

- Radiology administrators
- Directors of radiology
- Chief technologists
- Quality assurance managers
- Clinical/biomedical engineering managers
- Lead service supervisors
- OEM capital asset managers
- Third party service providers

## Objectives

- Understand general network architecture.
- Understand advanced network architecture.
- Understand primary functions of TCP/IP and why it works in a hospital environment.
- Recognize the key components of a DICOM conformance statement.
- Recognize and understand the terminology used in DICOM, PACS, and computer technology.

- Understand the DICOM standard and its importance to PACS, RIS, and HIS.
- Learn history of patient archiving and the transition to PACS.
- Apply the benefits of going filmless, while managing the growth of PACS in your facility.
- Stay abreast of new developments in PACS and new technology.

## Course Outline

### DAY 1

#### Introduction to Networking

- I. Two major types of networks
  - A. Peer-to-Peer
  - B. Server Based
- II. Network design (basic topologies)
  - A. Bus
  - B. Ring
  - C. Star
- III. Networking cabling
  - A. Coax
  - B. Twisted pair
  - C. Fiber optics
  - D. PDPM-wireless for DICOM
- IV. Network interoperability
  - A. OSI model
    1. Layers
    2. Additions to the layers
  - B. Protocols
    1. TCP/IP
  - C. Network operating systems
- IV. Network administration
  - A. Security
    1. Local vs. network
    2. Peer-to-peer vs. centralized
    3. File systems
  - IV. Advanced WAN technologies
    - A. ATM
    - B. FDDI

### DAY 2

#### Introduction to DICOM

- I. History of DICOM
  - A. ACR/NEMA 1.0
  - B. ACR/NEMA 2.0
  - C. DICOM 3.0
- II. DICOM interoperability
  - A. DICOM model
  - B. DICOM IODs
    1. Modality worklist
  - C. DICOM conformance statements
  - D. Integration testing
- III. DICOM standard implementation
  - A. HIS/RIS interoperability
  - B. Structured reporting
- IV. DICOM issues
  - A. Manufacturer issues
  - B. Regulatory issues
  - C. Technical issues
- V. Display standard
  - A. Image consistency
  - B. LUTs (Look up tables)
  - C. Monitor mapping, calibration and brightness
- VI. Current problems with DICOM

**Note:** Students will receive the Microsoft Certification study guides and CD ROMs.

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## **DAY 3**

### **Introduction to PACS**

- I. History of PACS
  - A. Early entrants
  - B. Standardization efforts
  - C. Federal government and PACS
- II. OEMs and evolution of PACS
  - A. GE/IBM
  - B. ATT/Philips
  - C. Siemens
  - D. Other OEMs
- III. PACS as a strategic investment for hospitals
  - A. Cost justification
  - B. Facility integration
  - C. System integration
- IV. Digital imaging
  - A. Modalities
- V. Archiving
  - A. WORM optical drive
  - B. Tape
  - C. MOD
- VI. Communication methods
  - A. Telephone lines (POTS)
  - B. Networking (LAN/WAN)
  - C. Microwave
- VII. Methods of implementation
  - A. Department wide PACS
  - B. Hospital wide PACS
  - C. Mini PACS
  - D. Inter-institutional PACS
- VIII. Acceptance criteria for PACS
  - A. Defining performance objectives
  - B. Acceptance of test criteria
  - C. Examples of acceptance criteria
  - D. Developing system expectations

## **DAY 4**

- I. Overview of the diagnostic imaging market
- II. Define Diagnostic Imaging Capital Asset Management
  - A. Overview of the ten programs that make up a Diagnostic Imaging capital asset management system
  - B. Getting started
    1. Management audit
    2. Equipment audit
    3. Cost benefit analysis
  - C. Key elements of capital asset management
  - D. Functions and roles of the department heads

## **DAY 5**

- I. Planning and Developing a 5-Year Capital Replacement Plan
  - A. How to prepare capital replacement plans and budgets
  - B. Bid and procurement policies and procedures
  - C. Remodeling/new construction
  - D. 5-Step process in preparing bid specifications
  - E. Analyzing the bidding process
  - F. Acceptance testing overview
  - G. Process in performing acceptance
    1. installation
    2. warranty
    3. ongoing life cycle
- II. Overall Review
- III. Final Exam