

Advanced Concepts of Digital Diagnostic Imaging Techniques - Level IV

Course length: 1 Week
CEU's Awarded: 4

<p>COURSE INTRODUCTION The Advanced Concepts of Digital Diagnostic Imaging Techniques - Level IV is a hands-on course designed to teach the service professional the skills necessary to service the New Digital Technology as applied to diagnostic imaging systems. Heavy emphasis is placed on digital imaging principles, image analysis, digital application, system integration, and preventive maintenance. The lectures, hands-on lab procedures, and documentation are designed to provide the student with the knowledge needed to maintain the New Digital Technology systems.</p>	<p>COURSE OBJECTIVES At the conclusion of this course, attendees will be able to:</p> <ul style="list-style-type: none"> ● Demonstrate their understanding of New Digital Technology application in Diagnostic Imaging. ● Verify system operation. ● Verify system specifications. ● Troubleshoot system problems. ● Perform first and second level preventive maintenance procedures. 	<p>PREREQUISITE FOR ADMISSION Attendees must possess the knowledge acquired through attendance at our Advanced Concepts of Fluoroscopic Imaging Maintenance - Level III, or the equivalent electronics and service experience. A strong microprocessor background is recommended</p>
<p>DAY 1 I. Introduction to digital imaging II. Digital vs. analog III. Radiation safety IV. Computer fundamentals A. DMA transfers B. Central processing unit C. Memory D. I/O techniques E. I/O devices 1. Disc drives 2. Laser discs F. System troubleshooting G. Operating systems H. Computer preventive maintenance V. Computer troubleshooting techniques A. Diagnostic software B. Minimum system C. Functional checks D. Common bus problems LAB ACTIVITIES I. System operation II. Component location III. Backing up system software IV. Backing up diagnostics software V. Loading software VI. PM procedures DAY 2 I. Image quality assurance A. Spatial resolution B. Uniformity C. Contrast D. Linearity E. Modulation transfer function F. Point spread function G. System factors affecting resolution / contrast II. Contrast media III. Comparison of manufacturers' image specification</p>	<p>IV. Digital imaging phantoms V. TV camera parameters A. Acquisition time B. Synchronization C. Beam park D. Gray scale / latitude E. Dynamic range F. Persistence / lag G. Progressive vs. interlaced VI. CCD cameras A. Advantages and limitations B. Construction C. Servicing VII. Digital fluoroscopy A. Frame grabber B. Last image hold LAB ACTIVITIES I. Performance images A. Spatial resolution evaluation B. Contrast evaluation C. Uniformity evaluation D. Linearity evaluation II. Resolution and contrast parameters manipulation III. Camera system physical layout IV. Camera evaluation V. Camera calibration DAY 3 I. Digital imaging A. Image data accuracy B. Image data manipulation 1. Digital subtraction angiography a. Temporal subtraction b. Energy subtraction 2. Image registration C. Digital imaging acquisition techniques 1. Frame grabber 2. Digital spot 3. Digital vascular 4. Cine loop 5. Digital cine D. Digital image formation 1. Fourier transformation</p>	<p>a. Nyquist limit b. Aliasing 2. System bandwidth 3. Signal to noise ratio 4. Image algorithms 5. Gamma correction 6. X-ray spectral analysis LAB ACTIVITIES I. Digital imaging acquisition techniques DAY 4 I. Digital imaging manipulation techniques A. Window width and leveling B. Isodensity/highlight C. Standard deviation D. Profiling E. Field of view / matrix size F. Registration II. Digital display techniques A. Laser imagers 1. Laser imager film 2. Matrix sizes 3. Image formats and sizes B. TV printers C. Video graphic generators 1. Cursor generation 2. Image control III. Common display system problems LAB ACTIVITIES I. Digital imaging manipulation techniques II. Display system operation III. Display system calibration DAY 5 I. X-ray film digitizing A. Laser scanning B. Manufacturer comparisons II. Teleradiology A. Phone modem B. Satellite links C. Baud rates III. Final exam IV. Final exam critique V. Course evaluation VI. Parts sourcing</p>