GE Healthcare

Education Services

Network Infrastructure and Protocols Training
Technical Education
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technical service training
tailored to fit your needs!

**about technical education from GE Healthcare**

GE Healthcare Education Services delivers technical education for Diagnostic Imaging, Computed Tomography, Magnetic Resonance, Mammography, Nuclear Medicine/PET, Ultrasound, Monitoring, Diagnostic Cardiology, Infant Care and Anesthesia Delivery Systems and Respiratory products. We also offer a curriculum of Network Infrastructure and Protocols Training classes focused specifically on the needs of today’s biomedical and technical professionals.

**our goal**

To be recognized as the global leader in healthcare education solutions.

- Building customer knowledge and competencies through a diverse educational portfolio in an increasingly complex healthcare environment.
- Striving to exceed customer expectations by delivering exceptional quality education that is clinically relevant and has a measurable impact on practice.
- Be a provider of choice for Network Infrastructure and Protocols Training education regardless of medical equipment choices, previous learning or experience.

**registration instructions**

Registration is online. Go to www.gehealthcare.com/training and choose the appropriate category for course schedules and registration link. Select your course and complete all information. Print a copy for your files before submitting. When done, click on Save and Submit to send registration form to a Training Coordinator.

for healthcare IT courses only:


confirmation of enrollment is sent automatically via email.

**who can attend**

Network Infrastructure and Protocols Training courses from GE Healthcare are open to any biomedical, technical or IT professional, regardless of equipment choice. These courses are tailored to provide a hands-on learning environment that focuses specifically on the knowledge base needed to manage workflow and connectivity in this rapidly changing environment.

**GE health and safety policy**

GE Healthcare requires students to wear closed-toe and closed-heel shoes while attending training. Safety toe-shoes are required, but steel-toe shoe covers are available in the classroom. MR courses require composite toe safety shoes. Open-toe, high-heel shoes or sandals are not permitted.
policies and terms

attendance

• Students are required to arrive on time for class.
• Class start and end times vary. Please refer to your e-mail enrollment notification.
• For no-shows (i.e., registered students who do not attend the class but do not cancel in advance of the class start date), there is a no-show fee of full course tuition.
• Students must pass an assessment to receive certificate of successful completion.

low enrollment

GE Healthcare reserves the right to cancel classes due to low enrollment. Classes with low enrollment 15 business days prior to the scheduled date will be cancelled. Please consider this when booking your travel.

When GE Healthcare cancels a class, tuition will be refunded in full. Alternatively, tuition may be applied to the cost of another class scheduled to take place within 12 months of the original class.

GE Healthcare will not be held responsible for any travel costs incurred due to circumstances beyond our control, such as, but not limited to, hurricanes, tornados, or labor strikes.

cancellations

• Cancellations can be made by email or phone: edservices@ge.com or by contacting 888-799-9921.
• For cancellations made more than 3 weeks prior to the class start date, there is no cancellation fee.
• For cancellations made 7-15 business days prior to the class start date, there is a cancellation fee of 25% of course tuition. For cancellations made 1-6 business days prior to the class start date, there is a cancellation fee of 50% of course tuition.
• For no-shows (i.e., registered students who do not attend the class but do not cancel in advance of the class start date), there is a no-show fee of full course tuition.
• GE reserves the right to cancel or reschedule any class for any reason and at any time. GE will not be held responsible for any travel costs incurred due to causes beyond our control, such as, but not limited to, hurricanes, tornados, or strikes.

order expiration

Diagnostic Imaging Courses - Training expires 24 months after order date.

Devices, Healthcare IT, and Ultrasound Courses - Training expires 18 months after order date.

use of media & recording devices

The Healthcare Institute’s (HCI) policies prohibit the use of any unauthorized personal removable media and recording devices in any courses, classrooms, and labs without the express consent of GE Healthcare. This includes, but is not limited to the following:

• Cell phones
• Still Cameras
• Video or audio recording devices
• Any external hard drives (Network or other)
• Any form of memory cards including, but not limited to, CompactFlash card, Secure Digital card (SD card), or Memory Stick
• Any other flash read/write media
• Any other USB read/write media

education centers

waukesha, wi

The Healthcare Institute has expanded to include classrooms to support anesthesia classes and our new Network Infrastructure and Protocols Training curriculum.

jupiter, fl

Our center of excellence for patient monitoring product support now includes new classrooms featuring our new Network Infrastructure and Protocols Training curriculum and many GE product training classes.

remote locations

Periodically, we take classes to strategic locations for added customer convenience. Check our website for the most current list of classes www.gehealthcare.com/training.

hosting a class

If you have a group to train, consider hosting a class at your facility. Our instructors can bring a number of our courses to you for maximum flexibility and convenience. You eliminate travel expense and have the advantage of training multiple staff at the same time, which can reinforce learning.

pre-requisites

Many classes contain lecture and lab exercises requiring networking skills. The fundamentals of networking are not covered in products classes.

The following IT skills are required prior to enrollment*:

• IP addressing
• switch troubleshooting
• troubleshooting wireless networks
• subnetting
• router configuration
• network connectivity
• hard drives
• access control paths

* courses requiring healthcare IT competency are identified on the course description page

accepted demonstration of healthcare IT competency:

• CompTIA Network+, Microsoft MCP®, or Cisco CCNA® certification
• Essentials of Healthcare ITSM
• Participants may complete a test to demonstrate IT competencies required for specific courses.

For your convenience, we now have one number to call for information on any course.

1-888-799-9921
Essentials of DICOM®

Have you ever wondered why your SCU doesn’t talk to your SCP?

Do you wonder why the studies on your PACS server are missing information?

This three-day hands-on class will help you gain the experience and skills to understand how medical devices communicate, using DICOM. You will utilize DICOM simulators in conjunction with medical scanners to step through DICOM services (in real-time) including Image Store, Modality Worklist, Printing, and more. This course will also help you achieve an overview of the DICOM standard and DICOM conformance statements.

course competencies:
upon successful completion of this course, the student should be able to:

- Identify the types of devices and their uses on a digital imaging network
- Understand digital imaging workflow
- Identify where DICOM is used on a network
- Learn to troubleshoot connectivity across the layers of the OSI model within an imaging network, and isolate network connectivity issues from DICOM configuration issues
- Learn how to use the conformance, information object definition, service class specifications, and data dictionary sections of the DICOM standard
- Analyze common associations including verify, store, store commit, print, query retrieve, and MPPS
- Locate DICOM conformance statements on the Internet
- Compare DICOM conformance statement to predict connectivity between devices
- Demonstrate proficiency with the basic configuration requirements for DICOM connectivity
- Master the use of DICOM simulators, including DICOM Validation Tool Kit
- Demonstrate proficiency in the recording, playback, and analysis of network sniffers such as DICOM Validation Tool Kit

intended audience:
- Biomedical equipment technicians
- Biomedical and clinical engineers
- Biomedical and clinical engineering managers
- Medical technology managers
- Hospital IT staff
- Radiologists
- Any professional who supports the field of medical technology

Bring this class to your location.
Call for pricing and details: 888-799-9921
Essentials of Healthcare ITSM

Unable to see all devices on your patient monitor network? Having trouble routing data from your radiology department to your PACS server?

In Essentials of HCIT, you’ll learn the key concepts of network connectivity that enable or impair system communications. Hands-on labs teach you building, programming, and troubleshooting switched, wireless, and routed networks. Topics such as virtual local area networks (VLANS), port security, and wireless security are also covered. In addition, you’ll learn the concepts of routing and the roles routers play in your network—forwarding data; acting as firewalls, demilitarized zones, and dynamic host configuration protocol (DHCP) servers; and how routers are dynamically and statically programmed to forward data. A hands-on lab gives you the opportunity to implement and troubleshoot a statically routed internetwork.

*Note:* Our Healthcare IT courses may help enhance the IT skills of all participants regardless of medical equipment choices, previous learning or experience.

course competencies:
upon successful completion of this course, the student should be able to:

- Examine computer hardware and demonstrate mastery of component identification and installation through the assembly of a PC
- Add hardware, drivers, and peripherals to systems through the installation of printers and NICs
- Computer management and troubleshooting tools through the installation of printers and NICs
- Develop basic mastery of operating system navigation through use of the GUI and the command line
- Flat network design, construction, and troubleshooting
- Switched network design, construction, and troubleshooting
- Routed network design, construction, and troubleshooting
- Wireless network design, construction, and troubleshooting

intended audience:

- Biomedical equipment technicians
- Biomedical and clinical engineers
- Biomedical and clinical engineering managers
- Medical technology managers
- Hospital IT staff
- Any professional who supports the field of medical technology

product number
Tuition:
2030677-001  M1056773  R0248PG  $4,250
Tuition & lodging:
2030677-002  M1118581  R0249PG  $5,175
Tuition, lodging & air:
2030677-003  M1118582  R0250PG  $6,070*

*US only

delivery method
class
length of course
4 days

program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.

Bring this class to your location.
Call for pricing and details: 888-799-9921
Essentials of HL7®

Is your patient data not properly populating in the EMR system?

Does your billing system have trouble finding the codes for medical procedures from your emergency department and lab systems?

This course will teach you how clinical workflow translates to dataflow, and how applications use the HL7 language to move information properly from one system to another. You’ll gain the ability to read and troubleshoot HL7 interface data messages—including how to use the HL7 standards and external coding systems to properly populate and look up data codes.

Advanced courses designed for HL7 integrators are available online.

course competencies:
upon successful completion of this course, the student should be able to:

• Identify the purpose of HL7 within a healthcare setting
• Identify the relationship between workflow and dataflow in an HL7 environment
• Evaluate the advantages and disadvantages of point-to-point interfaces and HL7 engines
• Use the HL7 V2.x standard for structure and encoding rules
• Analyze common patient administration, order, results, and charges messages for conformance to the HL7 standard
• Perform basic troubleshooting using the HL7 Messaging Workbench software
• Explore key components of the interface design process

intended audience:
• Biomedical equipment technicians
• Biomedical and clinical engineers
• Biomedical and clinical engineering managers
• Medical technology managers
• Hospital IT staff
• Any professional who supports the field of medical technology

product number
Tuition:
2020786-167   $2,350
M1183243
R0344PG
Tuition & lodging:
2020786-168   $2,905
M1183244
R0345PG
Tuition, lodging & air:
2020786-169   $3,800*
M1183246
R0346PG
*US only

delivery method
class
length of course
3 days

program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.

Bring this class to your location.
Call for pricing and details: 888-799-9921
Introduction to HL7® Clinical Document Architecture Release 2.0

Gain key business drivers to help build a business case for Clinical Document Architecture (CDA) support within an organization. Increase efficiency in implementing CDA in health information exchanges and learn to incorporate Clinical Document Architecture into medical device design.

Designed for HL7 integrators, software architects, or product managers, the Introduction to HL7 Clinical Document Architecture Release 2.0 is a two hour online course providing an overview of the construction and use of CDA documents. HL7’s Clinical Document Architecture is a global standard using Extensible Markup Language (XML) to address the format, storage and exchange of clinical documents within a health system or between many health systems.

Keith Boone, GE Standards Architect and co-chair of many HL7 and IHE technical committees, presents an overview of implementing CDA, including its structure and semantics.

course competencies:
upon successful completion of this course, the student should be able to:

• Learn the evolution of CDA
• Learn the key classes of the HL7 V3 Reference Information Model (RIM) and how they relate to CDA
• Learn the key properties of a CDA document
• Identify CDA Data Types and Classes
• Learn the steps in creating a CDA instance
• Create a CDA header
• Learn to structure the clinical data within CDA documents into sections and text
• Learn how CDA is used to store and move clinical information within and between healthcare systems

product number
Tuition:
2020786-234   $295

delivery method
online

program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.
Introduction to HL7® Continuity of Care Profile

This is the third program in the GE Healthcare series on standards for health information exchange. This series helps you better understand the standards that are being used worldwide to exchange clinical information between providers and their patients.

This program is an Introduction to HL7 Continuity of Care Profile.

Course competencies:
upon successful completion of this course, the student should be able to:

• Gain an understanding of the structure and syntax of the continuity of care document (CCD).
• Implement the CCD.

Product number
Tuition:
$295

Delivery method
Online

Program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.
Introduction to IHE Cross Enterprise Document Sharing Profile

As the adoption of electronic medical records increases, so does the need for standardized clinical information exchange. In 2005, IHE developed the Cross Enterprise Document Sharing (XDS) Profile to share clinical and financial information between healthcare providers and from healthcare providers to their patients. Students attending this online class will learn the XDS actors and transactions as well as the structure and metadata of an XDS message.

**product number**
Tuition: 2020786-266 $295

**delivery method**
online

**length of course**
1 hour

**prerequisite recommended**
Basic knowledge of HL7® V3

**program information**
Please visit www.gehealthcare.com/training for the most current information on dates and locations.
Securing the Healthcare IT Environment℠

With your patient systems connected to both segregated and IT network equipment, how can you be sure your patient information is safe and secure?

What wireless security can you use to protect and segregate clinical and nonclinical systems in your hospital?

This course teaches you the requirements for healthcare clinical and IT systems and networks to enable compliance with both manufacturer and US government Healthcare Information Privacy regulations. The course covers requirements of the HIPAA, ARRA, and HITECH Acts, as well as how to develop policies and plans for documenting current clinical and non-clinical systems and networks. Full 802.11 wireless security labs help you learn to differentiate between wireless security methods and what is required for setup.

course competencies:
upon successful completion of this course, the student should be able to:

• Have awareness of the global data protection environment and relevant national standards organizations, including: ISO, HIPAA, BS, and TGA
• Review the HIPAA Privacy and Security Rule standards and understand their impact on healthcare IT regarding information integrity, availability, and confidentiality
• Learn the 18 elements of electronic protected health information (ePHI)
• Understand how ePHI moves across a healthcare IT network
• Review MDS2 sheets to locate relevant ePHI information
• Learn the top ten network risks affecting healthcare IT systems
• Learn the AAA (authentication, authorization, and accounting) strategy for HCIT networks
• Configure software firewalls
• VPN, SSL, and IPSec concepts for securing remote data transport
• Explore the ACCE/ECRI risk analysis program for new and existing equipment
• Understand implications of applying patches and OS upgrades to devices on a HCIT network
• Examine physical security measures for healthcare IT systems
• Secure a home network

intended audience:
• Biomedical equipment technicians
• Biomedical and clinical engineers
• Biomedical and clinical engineering managers
• Medical technology managers
• Hospital IT staff
• Any professional who supports the field of medical technology

product number
Tuition:
2020786-053 M1126775 R0265PG $5,000
Tuition & lodging:
2020786-054 M1126785 R0266PG $5,925
Tuition, lodging & air:
2020786-055 M1126786 R0267PG $6,820*

*US only

delivery method
class
length of course
5 days

IT skills required
GE Essentials of Healthcare IT or equivalent

program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.
Wireless in the Healthcare IT Environment™

Do the transmitters on your patient telemetry system lose data connectivity intermittently?

Do the wireless patient monitors in your facility ever experience radio frequency interference (RFI)?

Through hands-on labs, design, install, and troubleshoot wireless medical telemetry systems (WMTS), and patient monitor systems, including using a spectrum analyzer for site surveys. The course also covers the concepts of radiofrequency (RF) energy and wireless propagation in the major frequencies used in healthcare, including antenna design, RF interference, distortion, and diversity, as well as 802.11 modulation, throughput, and coexistence.

course competencies:
upon successful completion of this course, the student should be able to:

• Present the basic concepts of RF, including: propagation, antennas, signal strength, reflection, diffraction, scatter, null spot, and attenuation

• Recognize physical topologies of RF systems within a healthcare environment, including: coaxial systems, distributed antenna, distributed access point, and controlled access points

• Recognize the hardware used to build RF systems, including: medical telemetry, WiFi, RFID, and wireless patient monitoring

• Associate a wireless service used within healthcare to a specific frequency range, including: medical telemetry, wireless patient monitoring, RFID, and cellular communications

• Monitor the RF environment for changes in performance of existing systems

• Perform WMTS and 802.11 site surveys

• Describe issues surrounding wireless coexistence

• Perform antenna splitter board troubleshooting using a spectrum analyzer

• Specify the importance of quality of service in healthcare networks

• Demonstrate awareness of the integrity and security of data transmitted wirelessly

• Understand access point associations and how they occur by building secure 802.11 networks

• Troubleshoot signal drop-out due to transmitter, application, infrastructure, operator error, and RF interference

• Explain the role of a frequency coordinator in a healthcare setting

intended audience:
• Biomedical equipment technicians
• Biomedical and clinical engineers
• Biomedical and clinical engineering managers
• Medical technology managers
• Hospital IT staff
• Any professional who supports the field of medical technology

product number
Tuition:
2020786-050 $5,000
M1126782
R0268PG
Tuition & lodging:
2020786-051 $5,925
M1126793
R0269PG
Tuition, lodging & air:
2020786-052 $6,820*
M1126795
R0270RG
*US only

delivery method
class

length of course
5 days

IT skills required
GE Essentials of Healthcare IT or equivalent

program information
Please visit www.gehealthcare.com/training for the most current information on dates and locations.