

Philips Medical Systems has provided an update to their training requirements for the student who plans to support the Brilliance Air Family. A series of E-learning and didactic courses are described below:

## **Safety**

**Course Number: FC9002**

Class Length: at students pace

Delivery method: E- Learning

## **Imaging Systems Safety**

**Course Number: FC9003**

Class Length: at students pace

Delivery method: E- Learning

## **Service Tools**

**Course Number: FC9005**

Class Length: at students pace

Delivery method: E- Learning

## **DICOM**

**Course Number: FC9008**

Class Length: at students pace

Delivery method: E- Learning

## **Connectivity - Basic**

**Course Number: FC9017**

Class Length: at students pace

Delivery method: E- Learning

## **Connectivity - Advanced**

**Course Number: FC9017**

Class Length: at students pace

Delivery method: E- Learning

E-Learning is provided by Philips. Once registration is completed, the materials are available at:

<https://www.theonlinelearningcenter.com/default.aspx?ReturnUrl=%2fMain.aspx>

Additional course materials are described below:

## **CT Basics Virtual Classroom**

**Course Number: CT1020**

Class Length: 4 days Virtual Classroom

Delivery Method: Blended Learning: ILT - Virtual

Modality: CT

Location: PHC Academy via Adobe Connect

Accreditation: Prerequisite for the follow-on CT courses

Audience: Service Engineers, Biomedical Engineers

Applicable System Code(s):

**Course Description:**

This course provides the biomedical service engineer a service-related overview of the fundamental concepts of CT systems. It prepares the engineer for advanced study in CT equipment-specific courses.

In an effort to better utilize the engineer's time and improve life/work balance, this course uses a unique delivery method; a 'distance learning' knowledge component for foundational lessons, and an on-site skills session, which is completed after student arrival at the Academy location for CT scanner training. Completion of this course requires that both sessions; the on-line knowledge (CT1020) and the on-site skills (CT1021) session be completed.

- The on-line portion of the course will be conducted in an average of 4 hours each day over the course of 4 consecutive scheduled days. To successfully complete this course, the time for completion during these 4 days must be set aside, just as if the service engineer were physically at the Academy location.
- Assessments will be given in the class.
- Lessons will be delivered on-line, via webinar-style real-time sessions with all the students participating at the same time, or by podcasts with interactive discussions and question & answer sessions to follow.
- Students will be given assignments and will receive points for participation and completion. A minimum number of points must be received in order for successful completion of the knowledge portion of the class and for participation in the skills portion.

**Course-Ware: & Prerequisites:**

The student must have a PC with internet access, Internet Explorer 8 or higher, a current and valid IST license and IST entitlements to Customer Service. The student should have an academic or experiential background in physics or electronics prior to enrolling in this course.

**Course Aims:**

Upon successful completion of the CT Basics course, and given a CT System, the student will be able to:

- List the major physical components of a CT System.
- List the functions a CT system performs to make an image.
- Describe the steps an operator would take to make a typical study.
- Define terms commonly used in CT.
- Explain how x-ray data is collected and transferred.
- Explain how the data is reconstructed into image data.
- Explain how the data is displayed on a monitor.
- List typical image manipulations.
- List the functions of the patient support.
- List the factors influencing image quality and how each affects spatial and contrast resolution.
- Relate the preceding knowledge to the Philips CT Systems.

**Key Topics:**

- System Overview
- Scanning a Patient
- Collecting Data
- Image Reconstruction
- Image Display
- Factors Affecting Image Quality
- Controlling the System
- Medical Imaging Overview

- Basic X-ray Fundamentals

## **CT Basic Skills Lab**

### **Course Number: CT1021**

Class Length: 1 day

Delivery Method: FLEX-Skills

Modality: CT

Location: Skills @ CTC or PHC

Accreditation:

Audience: Service Engineers, Biomedical Engineers

Applicable System Code(s):

### **Course Description:**

This course provides the biomedical & service engineer a service-related overview of the fundamental concepts of CT systems. It prepares the engineer for advanced study in CT equipment-specific courses. In an effort to better utilize the engineer's time and improve life/work balance, this course uses a unique delivery method:

- a 'distance learning' knowledge component for foundational lessons and
- an on-site skills session, which is completed when the student arrives at the Academy location for CT scanner training. Completion of this course requires that the on-line knowledge session and the on-site skills session be completed.
- This hands-on skills portion of the course permits the engineer a chance to evaluate good image quality and observe the changes to the images when specific scan parameters are changed. This is accomplished by having the engineer arrive at the Academy 1 working day prior to the start of an on-site CT scanner course and takes approximately 4 to 6 hours. It also gives both a refresher to the material AND offers the opportunity for early exposure to the equipment on which the student will be training giving the student a head start on the next course.

### **Course-Ware and Prerequisites:**

CT1020 - CT Basics Virtual Classroom

The student must have a PC with internet access, Internet Explorer 8 or higher, a current and valid IST license and IST entitlements to Customer Service.

The student should have an academic or experiential background in physics or electronics prior to enrolling in this course.

### **Course Aims:**

Upon successful completion of the complete CT Basics course, consisting of CT1020 and CT102, the student with a given CT system will be able to:

- List the major physical components of a CT System.
  - List the functions a CT system performs to make an image.
  - Describe the steps an operator would take to make a typical study.
  - Define terms commonly used in CT.
  - Explain how x-ray data is collected and transferred.
  - Explain how the data is reconstructed into image data.
  - Explain how the data is displayed on a monitor.
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- List typical image manipulations.
  - List the functions of the patient support.
  - List the factors influencing image quality and how each affects spatial and contrast resolution.
  - Relate the preceding knowledge to the Philips CT Systems.

- With a functioning CT scanner, scan an image test phantom and evaluate the resulting images for quality, uniformity, linearity, low contrast resolution and spatial resolution.
- Scan an imaging test phantom, modify the relevant protocol parameters and evaluate the resulting images for changes in uniformity, linearity, low contrast resolution and spatial resolution.

**Key Topics:**

- Scanning a patient
- Factors Affecting Image Quality

**Brilliance / Ingenuity / iCT Gateway**

**Course Number: CT3020**

Class Length: 5 days

Delivery Method: Lecture / Lab

Modality: CT

Location: Training Centers

Accreditation:

Audience: Philips Service Engineers, Customer Engineers

Applicable System Code(s): N/A

Course Description:

This course contains the material required for a FSE not trained on the Brilliance (air) CT system to prepare to attend the Brilliance Air system course or the Brilliance iCT differences course. The course provides the engineer with the knowledge and the skills required to safely install, calibrate and repair the Couch, CIRs and Host subsystems. In addition, the FSE learns the System operation, Software installation and Remote Services Network configuration processes.

**Course-Ware and Prerequisites:**

CT1020 CT Basics Skills Virtual Class

FC9002 Safety

FC9003 Imaging Systems Safety

FC9004 Regulatory

E-Learning material located at:

<https://www.theonlinelearningcenter.com/default.aspx?ReturnUrl=%2fMain.aspx>

**Course Aims:**

At the end of this course, the student will be able to:

- Operate a Brilliance System
- Identify failures pertaining to the operator interface
- Use Gantry State information to troubleshoot system problems
- Troubleshoot problems related to Gantry communications
- Follow prescribed Safety procedures
- Use available Service Tools for troubleshooting
- Calibrate Gantry angulation and couch
- Perform Planned Maintenance tasks following the recommended schedule
- Identify and perform the procedures to Remove and Replace key FRUs
- Perform corrective maintenance for the Couch, CIRs, Host and Gantry
- Angulation and Communication subsystems
- Perform documented software installation procedures
- Enable Philips service level diagnostics with IST/ICE

## **Brilliance Air Family**

**Course Number: CT3021**

Class Length: 10 days

Delivery Method: Lab-based training

Modality: CT

Location: CTC, PHC, SLC

Accreditation:

Audience: Service Engineers, (BioMeds in NA only)

Applicable System Code(s):

### **Course Description:**

The customer service engineer who completes this course will be able to troubleshoot, repair and maintain any of the seven systems in the Brilliance Air Family:

- Brilliance Air 6/10/16
- Brilliance Air 16Power
- Brilliance Big Bore
- Brilliance Air 40-slice
- Brilliance Air 64-slice (U or TDMS configurations)

### **Course-Ware and Prerequisites:**

- CT3020 – Brilliance/Ingenuity/iCT Gateway

The following are required if not completed as a prerequisite for a previous course:

- FC9002 Safety
- FC9003 Imaging Systems Safety
- FC9004 Regulatory
- E-Learning Located at:

<https://www.theonlinelearningcenter.com/default.aspx?ReturnUrl=%2fMain.aspx>

### **Course Aims:**

At the end of this course, the student will be knowledgeable in:

#### **System Overview**

- Follow the procedures in the Installation Manual to install the Brilliance system
- Demonstrate safe practices when working with, in or around a Brilliance scanner
- Physically identify system covers and follow the procedures to remove, replace and align them

#### **Operator Interface**

- Identify a Gantry Controls-related failure to the lowest Field Replaceable Unit using a time effective method
- Follow the instructions provided to calibrate or adjust the components related to the Operator Interface
- Follow the instructions to perform key system operations related to the Operator Interface

- Physically identify Field Replaceable Unit components of the gantry controls and follow the procedures to remove, replace and align them

### **Power Distribution**

- Identify a power distribution-related failure to the lowest Field Replaceable Unit using a time effective method
- Follow Installation instructions to connect the power distribution components of the system
- Follow the prescribed safety methods to avoid electrical and ESD hazards pertaining to power distribution
- Physically identify Field Replaceable Unit components of the power distribution and follow the procedures to remove and replace them

### **Communications**

- Identify a communications-related failure to the lowest Field Replaceable Unit using a time effective method
- Identify and use the procedures to remove, replace and align the Field Replaceable Units related to communications

### **Service Tools**

- Identify and use key service tool diagnostic to diagnose failures in the system in a time effective method.
- DMS (Data Measurement System)
- Identify a DMS/TDMS-related failure to the lowest Field Replaceable Unit using a time effective method
- Physically identify Field Replaceable Unit components related to the Data Measurement System and follow the procedures to replace them

### **High Voltage**

- Identify a high voltage system-related failure to the lowest Field Replaceable Unit using a time effective method
- Physically identify Field Replaceable Unit components related to the high voltage system and follow the procedures to remove and replace them

### **Rotor Motion**

- Physically identify Field Replaceable Unit components related to rotor motion and follow the procedures to remove, replace and align them
- Identify a rotor motion-related failure to the lowest Field Replaceable Unit using a time effective method

### **Beam Path**

- Identify a collimator-related failure to the lowest Field Replaceable Unit using a time effective method
- Physically identify Field Replaceable Unit components of the beam path and follow the procedures to remove, replace and align them
- Perform calibrations related to the collimator to ensure accurate CT image quality

### **Image Quality**

- Perform the constancy tests
- Perform acceptance testing
- Calibrate the Brilliance Air scanner