Hughes Technical Training

Course Catalog

2017
# TABLE OF CONTENTS

PRODUCT TRAINING FOR EXTERNAL AND INTERNAL CUSTOMERS .................. 3

HX SYSTEM COURSES .............................................................................. 6

JUPITER SRS SYSTEM COURSES .......................................................... 13

JUPITER SYSTEM COURSES ................................................................... 19
COURSE OFFERINGS AND FACILITY OVERVIEW

The Hughes Technical Training Group’s objective is to provide customers and employees with world-class training that supports our products and services. We have a state-of-the-art training facility located in our Shady Grove (SGZ) building, with fully functioning laboratories and professionally qualified staff. A training registrar is available to take customer course reservations through the program manager.

Technical Training consists of a staff of professional trainers that instruct customers on Hughes’ major products, utilizing over ten independent courses. Our SGZ facility includes 2 modern training rooms equipped with glassed-in laboratories dedicated to our program. At our training facility, customers and employees learn the technical and operational aspects of Hughes’ products and systems. Students obtain direct exposure to the hardware and receive hands-on training that is not limited to the restrictions of a live network operations center. Multiple courses are offered on all of the major company product lines. Special course sequences can be designed with adequate advance notice and global customer site delivery of training remains an option available to our customers. Customer-site training will be subject to reduced curriculum and equipment limitations. 

Customers are strongly encouraged to attend class at our local facility in Gaithersburg, Maryland to maximize student participation in class exercises performed on dedicated training equipment. Customer-site training using the customer’s equipment reduces the effectiveness of the exercises due to access limitations, preventing some exercises from being performed at all. Course duration will be adjusted to accommodate these limitations.

Some of the areas where courses are regularly offered include the following:

HX SYSTEM

The HX system is optimized for small networks while still providing high speed outroute and inroute connectivity for TCP/IP applications. The system is comprised of a Gateway (GTWY) and the HX50, HX1xx, and HX2xx family of remotes. The courses cover a system design and functional overview, remote installation and management, and GTWY operations and sizing.

JUPITER SRS SYSTEM

The Jupiter SRS System is a Hughes VSAT network providing high speed broadband TCP/IP connections for enterprise customers. The system is comprised of a Gateway and multiple HT1xxx terminals. The courses cover a system design overview, terminal installation and management, network operations and maintenance and sizing, as well as virtual network operation course designed for virtual network customers.
JUPITER SYSTEM

The Jupiter System is a new Hughes VSAT network providing high speed broadband TCP/IP connections for consumer and enterprise customers. The system is comprised of one or more Gateways and multiple HT2xxx terminals. The courses cover a system design overview, terminal installation and management, network operations and maintenance and sizing, as well as virtual network operation course designed for virtual network customers.
## PRODUCT LINE COURSES

### Local/Onsite Training Courses:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Duration Days**</th>
<th>Cost Local/Onsite</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-HX0900</td>
<td>HX System Introduction</td>
<td>2</td>
<td>$1,400/$5,600</td>
</tr>
<tr>
<td>TC-HX0910</td>
<td>HX System Satellite Router Installation and</td>
<td>1</td>
<td>$700/$2,800</td>
</tr>
<tr>
<td></td>
<td>Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC-HX0920</td>
<td>HX System Network Operations</td>
<td>3</td>
<td>$2,100/$8,400</td>
</tr>
<tr>
<td>TC-HX0930</td>
<td>HX System Configuration and Design</td>
<td>4</td>
<td>$2,800/$11,200</td>
</tr>
<tr>
<td>TC-HX0940</td>
<td>HX System Sizing</td>
<td>2</td>
<td>$1,400/$5,600</td>
</tr>
<tr>
<td>TC-HX0950</td>
<td>HX Virtual Network Operations</td>
<td>4</td>
<td>$2,800/$11,200</td>
</tr>
<tr>
<td>TC-JS0200</td>
<td>Jupiter SRS System Introduction</td>
<td>2</td>
<td>$1,400/$5,600</td>
</tr>
<tr>
<td>TC-JS0210</td>
<td>Jupiter SRS System Terminal Installation and</td>
<td>1</td>
<td>$700/$2,800</td>
</tr>
<tr>
<td></td>
<td>Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC-JS0220</td>
<td>Jupiter SRS System Network Operations and</td>
<td>7</td>
<td>$4,900/$19,600</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC-JS0230</td>
<td>Jupiter SRS System Sizing</td>
<td>2</td>
<td>$1,400/$5,600</td>
</tr>
<tr>
<td>TC-JS0240</td>
<td>Jupiter SRS System Virtual Network Operations</td>
<td>4</td>
<td>$2,800/$11,200</td>
</tr>
</tbody>
</table>

**Onsite Training Courses:**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Duration Days**</th>
<th>Cost Onsite</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-JS0300</td>
<td>Jupiter System Introduction</td>
<td>2</td>
<td>$5,600</td>
</tr>
<tr>
<td>TC-JS0310</td>
<td>Jupiter System Terminal Installation and Operations</td>
<td>1</td>
<td>$2,800</td>
</tr>
<tr>
<td>TC-JS0320</td>
<td>Jupiter System Network Operations and Maintenance</td>
<td>7</td>
<td>$19,600</td>
</tr>
<tr>
<td>TC-JS0330</td>
<td>Jupiter System Sizing</td>
<td>2</td>
<td>$5,600</td>
</tr>
<tr>
<td>TC-JS0340</td>
<td>Jupiter System Virtual Network Operations</td>
<td>4</td>
<td>$11,200</td>
</tr>
</tbody>
</table>

**Maximum class size is 12 students and the minimum is 4 students. Course duration is adjusted for customer-site training based on customer’s network design and access to the onsite equipment and resources. Customers are strongly encouraged to attend local training in Gaithersburg Maryland in order to prevent limited and interrupted training environments. Onsite courses are subject to an additional 25% and customized courses are subject to an additional 35%.**
HX SYSTEM COURSES

Recommended Sequence for ExpertNMS HX training courses:

1. **HX System Introduction**  
   TC-HX0900

2. **HX System Satellite Router Installation and Operations**  
   TC-HX0910

3. **HX System Network Operations**  
   TC-HX0920

4. **HX System Configuration and Design**  
   TC-HX0930

5. **HX System Network Sizing**  
   TC-HX0940

6. **HX System Virtual Network Operations**  
   TC-HX0950
HX System Introduction Course TC-HX0900

Course Purpose:
This course is designed to provide a detailed introduction to the HX System, which includes the GTWY and remote terminals, using the ExpertNMS user interface. The course provides fundamental knowledge for engineers, managers, technicians, operators, and other individuals who require a working knowledge of the product. Connectivity, traffic flow, and component functionality are discussed. This course is a prerequisite to the HX System GTWY operations course and HX System Sizing course.

Objectives:
This course introduces the major components of the HX System. It is intended to provide the student with a functional knowledge of the following subjects and equipment:

1. Overview of satellite communications and TCP/IP
2. HX System Architecture
3. HX System Features

Topical Outline:
- Satellite Communications and TCP/IP Overview
- HX System Design
  - GTWY design
  - Outroutes / Inroutes
  - Remote Types
- HX System Features
  - TCP/IP Features
  - Advanced Bandwidth Management Features
  - Satellite Link Features

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 2 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0900

Prerequisites: None
HX System Satellite Router Installation and Operations Course TC-HX0910

Course Purpose:
This course covers the installation, commissioning and maintenance of the HX System self-hosted remotes (HX50/HX2xx/HX90).

Objectives:
Upon completion of the program the student should be able to:
1. Install Hughes indoor unit
2. Utilize the Installer PC interface
3. Manually commissioning a remote
4. Point the antenna

Topical Outline:
• Introduction to Remote Equipment
• Remote Operation and Monitoring
• Remote Commissioning
• Antenna Pointing

Class Size:
• Minimum Number of Students: 4
• Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
• Duration: 1 Day

Course Location: At mutually agreeable customer location
• Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0910

Prerequisites: None
HX System Network Operations Course TC-HX0920

Course Purpose:
Introduce basic day-to-day monitoring of the HX system using ExpertNMS.

Objectives:
This course introduces the day-to-day monitoring and maintenance of the HX system. It is intended to give the GTWY Operator prerequisite knowledge to be able to perform the following tasks:
1. Explain the HX System signal flow and processing
2. Monitor network status and performance through ExpertNMS
3. Demonstrate basic troubleshooting skills
4. Perform routine maintenance tasks

Topical Outline:
• Introduction to HX NOC Components
• ExpertNMS Network Monitoring Tools
• Satellite Router Monitoring and Troubleshooting Tools
• HX System Maintenance

Class Size:
• Minimum Number of Students: 4
• Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
• Duration: 3 Days

Course Location: At mutually agreeable customer location
• Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0920

Prerequisites: Introduction to HX System course TC-HX0900
HX System Configuration and Design Course TC-HX0930

Course Purpose:
Teaches HX NOC GTWY administrators/operators how to configure and monitor their HX system using ExpertNMS GUI.

Objectives:
This advanced operations course focuses on network administrative parameters, NOC GTWY component configuration and monitoring, creating satellite router service plans, and managing outroute and inroute performance. It is intended to give the NOC GTWY Operator prerequisite knowledge to be able to perform the following tasks:

1. Explain the HX System configuration process using ExpertNMS
2. Load keys into the CAC
3. Manipulate ACS Lite for CAC configuration
4. Read/modify/create satellite routers in the ExpertNMS
5. Manage NOC GTWY configuration through the ExpertNMS
6. Monitor and manage network capacity

Topical Outline:
- Introduction to Network Management
- CAC Operations and Configuration
- Configuring Satellite Routers
- NOC Gateway Management
- Advanced Network Configuration

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 4 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0930

Prerequisites: Introduction to HX System course TC-HX0900
HX System Network Sizing TC-HX0940

Course Purpose:
This advanced course is designed to introduce the concepts and procedures used in network sizing and how to implement sizing in the HX System. During the course, outroute and inroute sizing are discussed.

Objectives:
Upon successful completion of this program the student should be able to:
1. Identify data required for network sizing
2. Perform basic sizing calculations for inroute and outroute
3. Understand parameters related with outroute and inroute sizing as well as QoS and IQoS

Topical Outline:
- Sizing Overview
- Outroute Sizing, related parameters, and ExpertNMS monitoring tools
- Inroute Sizing, related parameters, and ExpertNMS monitoring tools

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 2 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0940

Prerequisites: Introduction to HX System course TC-HX0800
HX System Virtual Network Operation Course TC-HX0950

Course Purpose:
Provides basic fundamental knowledge about HX System and teaches HX virtual network operators how to configure and monitor their HX virtual network using ExpertNMS GUI.

Objectives:
The course is intended to give the virtual network operator prerequisite knowledge to be able to perform the following tasks:

1. Understand HX System basic functions and key features
2. Monitor the virtual network status through ExpertNMS
3. Demonstrating basic troubleshooting skills
4. Read/modify/create satellite routers in the virtual network
5. Monitor and manage the virtual network capacity

Topical Outline:
- HX System Architecture
- Network Monitoring via ExpertNMS
- Satellite Router Configuration
- Capacity Configuration Monitoring

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 4 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-HX0950
JUPITER SRS SYSTEM COURSES

Recommended Sequence for Jupiter SRS System training courses:

1. Jupiter SRS System Introduction
   TC-JS0200

2. Jupiter SRS System Terminal
   Installation and Operations
   TC-JS0210

3. Jupiter SRS System Network
   Operations and Maintenance
   TC-JS0220

4. Jupiter SRS System Sizing
   TC-JS0230

5. Jupiter SRS System Virtual
   Network Operations
   TC-JS0240
Jupiter SRS System Introduction Course TC-JS0200

Course Purpose:
This course is designed to provide a detailed introduction to the Jupiter SRS System, which includes the high level system architecture and major key features. The course provides fundamental knowledge for engineers, managers, technicians, operators, and other individuals who require a working knowledge of the product. Connectivity, traffic flow, and component functionality are discussed. This course is a prerequisite to Jupiter SRS System NOC Operations and Maintenance training courses.

Objectives:
This course introduces the major components of the Jupiter SRS System. It is intended to provide the student with a functional knowledge of the following subjects and equipment:
1. Overview of satellite communications and TCP/IP
2. Jupiter SRS System Architecture
3. Jupiter SRS System Key Features
4. Jupiter SRS Gateway Description

Topical Outline:
- Satellite Communications and TCP/IP Overview
- Jupiter SRS System Architecture
  - Outroutes /Inroutes
  - NOC Gateway and terminals
- Jupiter SRS System Features
  - TCP/IP Features
  - Advanced Bandwidth Management Features
  - Satellite Link Features
- Jupiter SRS Gateway description

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 2 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-JS0200

Prerequisites: None
**Jupiter SRS System Terminal Installation and Operations Course TC-JS0210**

**Course Purpose:**
This course covers the installation, commissioning and maintenance of the Jupiter terminals (HT1200 and HT1300). Maintenance of the Hughes terminals is limited to the FRU level.

**Objectives:**
Upon completion of the program the student should be able to:
1. Install Hughes indoor unit
2. Commission a terminal
3. Familiar with the terminal Web UI

**Topical Outline:**
- Terminal Equipment
- Site Survey
- Remote Commissioning
- VSAT Antenna Pointing

**Class Size:**
- **Minimum Number of Students:** 4
- **Maximum Number of Students:** 12

**Course Location:** Hughes Technical Training, Gaithersburg, Maryland
- **Duration:** 1 Day

**Course Location:** At mutually agreeable customer location
- **Duration:** To be determined based on customer network design and facilities

**Course Number:** TC-JS0210

**Prerequisites:** None
**Jupiter SRS System Network Operations and Maintenance Course TC-JS0220**

**Course Purpose:**
Introduce basic day-to-day operations and maintenance of the NOC Gateway.

**Objectives:**
This course introduces the day-to-day operations and maintenance of Jupiter Gateway. It is intended to give the Gateway Operator prerequisite knowledge to be able to perform the following tasks:

1. Introduction to Jupiter Gateway components
2. Monitor Jupiter network via Jovian NMS
3. Manage Jupiter terminal services
4. Configure, monitor and control Jupiter terminals via Jovian
5. Manage Gateway components
6. Perform routine system maintenance such as system backup
7. Demonstrate basic troubleshooting skills via Jovian and Device Web UI

**Topical Outline:**
- Introduction to Gateway Components
- Jupiter Network Monitoring
- Terminal Management
- Gateway Management
- Gateway Maintenance

**Class Size:**
- Minimum Number of Students: 4
- Maximum Number of Students: 12

**Course Location:**
- Hughes Technical Training, Gaithersburg, Maryland
  - Duration: 7 Days

**Course Location:**
- At mutually agreeable customer location
  - Duration: To be determined based on customer network design and facilities

**Course Number:** TC-JS0220

**Prerequisites:** Jupiter SRS System Introduction course TC-JS0200
Jupiter SRS System Sizing TC-JS0230

Course Purpose:
This advanced course is designed to introduce the concepts and procedures used in Jupiter system sizing. During the course, space link and virtual network sizing are discussed.

Objectives:
Upon successful completion of this program, the student should be able to:
1. Estimate Jupiter space link capacity
2. Prepare Jupiter frequency plan
3. Understand VN subscription and terminal QoS parameters
4. Monitor VN capacity configuration
5. Size VN capacity based on the terminal QoS requirements

Topical Outline:
- Jupiter space link capacity and spectrum planning
- Virtual network subscription and monitoring
- Virtual network capacity sizing based on terminal QoS

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: Hughes Technical Training, Gaithersburg, Maryland
- Duration: 2 Days

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-JS0230

Prerequisites: Jupiter SRS System Introduction TC-JS0200
**Jupiter SRS System Virtual Network Operations Course TC-JS0240**

**Course Purpose:**
The course is designed for virtual network customers who don’t own the entire system but are able to access to the network management system to manage their own virtual network components.

**Objectives:**
This course introduces the system architecture, the day-to-day operations of a Jupiter virtual network and terminal commissioning process. It is intended to the following knowledge to the virtual network:

1. Understand Jupiter SRS System basic functions and key features
2. Monitor the virtual network status through Jovian
3. Demonstrating basic troubleshooting skills
4. Read/modify/create terminals in the Jovian VNO web portal
5. Commission a terminal

**Topical Outline:**
- System architecture
- Jupiter network monitoring
- Terminal configuration
- Terminal web interface
- Terminal commissioning

**Class Size:**
- **Minimum Number of Students:** 4
- **Maximum Number of Students:** 12

**Course Location:** Hughes Technical Training, Gaithersburg, Maryland
- **Duration:** 4 Days

**Course Location:** At mutually agreeable customer location
- **Duration:** To be determined based on customer network design and facilities

**Course Number:** TC-JS0240

**Prerequisites:** None
Recommended Sequence for Jupiter System training courses:

Jupiter System Introduction  
TC-JS0300

Jupiter System Terminal  
Installation and Operations  
TC-JS0310

Jupiter System Network  
Operations and Maintenance  
TC-JS0320

Jupiter System Sizing  
TC-JS0330

Jupiter System Virtual Network  
Operations  
TC-JS0340
Jupiter System Introduction Course TC-JS0300

Course Purpose:
This course is designed to provide a detailed introduction to the Jupiter System, which includes the high level system architecture and major key features. The course provides fundamental knowledge for engineers, managers, technicians, operators, and other individuals who require a working knowledge of the product. Connectivity, traffic flow, and component functionality are discussed. This course is a prerequisite to Jupiter System NOC Operations and Maintenance training courses.

Objectives:
This course introduces the major components of the Jupiter System. It is intended to provide the student with a functional knowledge of the following subjects and equipment:

1. Overview of satellite communications and TCP/IP
2. Jupiter System Architecture
3. Jupiter System Key Features
4. Jupiter Gateway Description

Topical Outline:
- Satellite Communications and TCP/IP Overview
- Jupiter System Architecture
  - Outroutes /Inroutes
  - NOC Gateway and terminals
- Jupiter System Features
  - TCP/IP Features
  - Advanced Bandwidth Management Features
  - Satellite Link Features
- Jupiter Gateway description

Class Size:
- Minimum Number of Students: 4
- Maximum Number of Students: 12

Course Location: At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

Course Number: TC-JS0300

Prerequisites: None
**Jupiter System Terminal Installation and Operations Course TC-JS0310**

**Course Purpose:**
This course covers the installation, commissioning and maintenance of the Jupiter terminals (HT2xxx). Maintenance of the Hughes terminals is limited to the FRU level.

**Objectives:**
Upon completion of the program the student should be able to:
1. Install Hughes indoor unit
2. Commission a terminal
3. Familiar with the terminal Web UI

**Topical Outline:**
- Terminal Equipment
- Site Survey
- Remote Commissioning
- VSAT Antenna Pointing

**Class Size:**
- Minimum Number of Students: 4
- Maximum Number of Students: 12

**Course Location:** Hughes Technical Training, Gaithersburg, Maryland
- Duration: 1 Day

**Course Location:** At mutually agreeable customer location
- Duration: To be determined based on customer network design and facilities

**Course Number:** TC-JS0310

**Prerequisites:** None
**Jupiter System Network Operations and Maintenance Course TC-JS0320**

**Course Purpose:**
Introduce basic day-to-day operations and maintenance of the NOC Gateway.

**Objectives:**
This course introduces the day-to-day operations and maintenance of Jupiter Gateway. It is intended to give the Gateway Operator prerequisite knowledge to be able to perform the following tasks:

1. Introduction to Jupiter Gateway components
2. Monitor Jupiter network via Jovian NMS
3. Manage Jupiter terminal services
4. Configure, monitor and control Jupiter terminals via Jovian
5. Manage Gateway components
6. Perform routine system maintenance
7. Demonstrate basic troubleshooting skills via Jovian and Device Web UI

**Topical Outline:**
- Introduction to Gateway Components
- Jupiter Network Monitoring
- Terminal Management
- Gateway Management
- Gateway Maintenance

**Class Size:**
- **Minimum Number of Students:** 4
- **Maximum Number of Students:** 12

**Course Location:** At mutually agreeable customer location
- **Duration:** To be determined based on customer network design and facilities

**Course Number:** TC-JS0320

**Prerequisites:** Jupiter System Introduction course TC-JS0300
**Jupiter System Sizing TC-JS0330**

**Course Purpose:**
This advanced course is designed to introduce the concepts and procedures used in Jupiter system sizing. During the course, space link and virtual network sizing are discussed.

**Objectives:**
Upon successful completion of this program, the student should be able to:
1. Estimate Jupiter space link capacity
2. Prepare Jupiter frequency plan
3. Understand VN subscription and terminal QoS parameters
4. Monitor VN capacity configuration
5. Size VN capacity based on the terminal QoS requirements

**Topical Outline:**
- Jupiter space link capacity and spectrum planning
- Virtual network subscription and monitoring
- Virtual network capacity sizing based on terminal QoS

**Class Size:**
- **Minimum Number of Students:** 4
- **Maximum Number of Students:** 12

**Course Location:** At mutually agreeable customer location
- **Duration:** To be determined based on customer network design and facilities

**Course Number:** TC-JS0330

**Prerequisites:** Jupiter System Introduction TC-JS0300
**Jupiter System Virtual Network Operations Course TC-JS0340**

**Course Purpose:**
The course is designed for virtual network customers who don’t own the entire system but are able to access to the network management system to manage their own virtual network components.

**Objectives:**
This course introduces the system architecture, the day-to-day operations of a Jupiter virtual network and terminal commissioning process. It is intended to the following knowledge to the virtual network:

1. Understand Jupiter System basic functions and key features
2. Monitor the virtual network status through Jovian
3. Demonstrating basic troubleshooting skills
4. Read/modify/create terminals in the Jovian VNO web portal
5. Commission a terminal

**Topical Outline:**
- System architecture
- Jupiter network monitoring
- Terminal configuration
- Terminal web interface
- Terminal commissioning

**Class Size:**
- Minimum Number of Students: 4
- Maximum Number of Students: 12

**Course Location:** At mutually agreeable customer location
- **Duration:** To be determined based on customer network design and facilities

**Course Number:** TC-JS0340

**Prerequisites:** None