INTRODUCING
THE EUROCONSULT GROUP
SPACE TRAINING SERVICE OFFER

TOPIC 1:
SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

2020 | 2021
CONTENTS

Our Training Service Offer In A Nutshell

Topic 1: Space technical & engineering fundamentals

Contact Information

Euroconsult Group Presentation
FROM STRUCTURING MARKET TRENDS TO TRAINING NEEDS

• Whatever their form or origin, **space infrastructure ambitions and related procurements follow less and less frequently « dry » or « blind » purchase rationales**, as:
  
  o They are increasingly part of a much broader picture, with related plans no longer limiting themselves to the sheer ownership — or even operational use — of the acquired capacity
  
  o Many national players from emerging countries — either established as space agencies, research centers or even satellite operators — have been mushrooming worldwide since the mid-2000s, translating into a flurry of “domsat” projects strongly hitting the market

• ...which increasingly places **capacity building issues at the center of related strategies**, as much powerful and efficient vehicles for:
  
  o Fostering inherent skills and a buildup of how-how
  
  o Gaining independence
  
  o Installing greater prominence, visibility and credibility amongst the international space community
GENERAL SERVICE APPROACH (1/2)

• Our training service offer provides **interdisciplinary knowledge transfer to governments, the private sector and not-for-profit organizations wishing to increase their expertise in the space sector**

• Fully adapted to customers’ specific needs, it **customizes both the content and format** of associated training programs **to match customers’ specific skill development goals**

• Delivered with an emphasis on **flexibility, accessibility** and **experiential learning**, this tailored service provides both **functional and executive-level training with defined outcomes**, among which:
  - Interdisciplinary training on all key aspects of the space industry: technical, markets, program management, etc.
  - Ability to benefit from prepackaged programs or create a customized program
  - Benchmarking, profiling, best practices and lessons learned from key players of the space sector
  - Possibility to organize tours of government and private industry facilities and meetings with international executives and officials
  - Flexibility in choosing a suitable training location, ranging from on-site training on customer premises, in our offices or in a prestigious third-party location
  - Exposure to training in a variety of mediums and formats, from videoconferences to face-to-face seminars, and hands-on exercises, over a few hours, days or week-long sessions
### TARGETED AUDIENCES

**Typical customers:**
- Satellite operators
- Government organizations
- Service providers
- Financial institutions
- Satellite manufacturers
- Launch service providers

**Typical attendees:**
- Executives
- Middle managers
- Program managers
- Operators
- Technicians

### KEY CUSTOMER BENEFITS

- Fully flexible content that can be either specifically designed or based upon standard packages
- Experiential learning enabling both demonstrable knowledge transfer and networking opportunities
- Access to a unique line-up of seasoned industry experts with extensive sectorial experience
- Combined access to a suitable selection of training venues, industry visits & customer care services

### SUPPORT SERVICES

- Adaptation of training course language if required
- Great variety of delivery mediums and formats
- Industrial/cultural visits and networking opportunities
- Flexibility for the most suitable training location
- Customer care service and follow-up
FROM TRAINING TOPICS TO DELIVERY MODES

• Our training service offer is based upon four main topics covering, over a total of 38 individual training modules, the full spectrum of issues to be considered to operate in the space sector, i.e.:
  o Space technical & engineering fundamentals
  o Satellite projects & programs management
  o Space legal, regulatory and spectrum management
  o Space industry & market dynamics

• ...available in two alternative delivery modes depending upon customer objectives, requirements, and constraints, i.e.:
  o Pre-packaged
  o Customized
### TRAINING CATALOG OVERVIEW

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Nb. of training modules</td>
<td>17</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Typical module duration range*</td>
<td>0.5 to 2 days</td>
<td>0.5 to 2 days</td>
<td>1 to 3 days</td>
</tr>
<tr>
<td>Typical contents</td>
<td>End-to-end technical and engineering space industry fundamentals</td>
<td>Space program management topics, from business planning to risk management assessment</td>
<td>Legal, regulatory and frequency challenges impacting business plans, investment and programs</td>
</tr>
<tr>
<td>Available delivery formats</td>
<td>Face-to-face or online</td>
<td>Face-to-face or online</td>
<td>Face-to-face or online</td>
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</table>

* Depending upon customer objectives, requirements, and constraints.
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- Our Training Service Offer In A Nutshell
- Topic 1: Space technical & engineering fundamentals
- Contact Information
- Euroconsult Group Presentation
TRAINING CATALOG DETAILS

• Structured along a topic-by-topic basis, the following slides provide an overview of each the 17 individual training modules in terms of:
  - Objectives
  - Prerequisites
  - Related modules
  - Typical duration and delivery format
  - Topics covered
  - Course director

• None of the content presented in this catalogue shall be considered as contractual. Any interested customer is kindly invited to contact us for a detailed technical and commercial proposal that will be derived from his specific objectives, requirements and constraints
TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

TRAINING MODULES LIST

1.1 General introduction to space missions
1.2 Space environment & associated constraints
1.3 Satellite system design, integration & tests
1.4 Satellite platform & subsystems
1.5 Quality control & assurance
1.6 Launch vehicles & satellite/launcher interfaces
1.7 Launch campaign & launch phase
1.8 Satellite control operations: From deployment to deorbitation
1.9 Satellite communications systems overview
1.10 Satellite communications systems: High Throughput Systems
1.11 Satellite communications systems: Flexible & reconfigurable systems
1.12 Satellite communications systems: Constellation systems
1.13 Telecom satellite mission operations
1.14 Satellite Earth observation systems overview
1.15 Satellite optical Earth observation systems
1.16 Satellite radar Earth observation systems
1.17 Professions & skills in the space sector
To be mastered

To go further

Connected with

TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.1: GENERAL INTRODUCTION TO SPACE MISSIONS

OBJECTIVE

• The objective of this course is to provide an overall summary of the engineering concepts required to understand the technical fundamentals of a space mission.

• Upon completion of this course, trainees will have learned the basics of the space environment, the main components of a space mission and the process for satellite system design.

PREREQUISITES

• No specific prerequisites. This course is an overview of space engineering for trainees with no technical background, or as a general introduction to more advanced courses in space engineering for trainees with a technical background.

RELATED MODULES

To be mastered

To go further

Connected with

0.5 to 1 day (4-8 hours)

• Face-to-face or online delivery

TOPICS COVERED

• A unique environment to address specific requirements

• Orbits and space environment
  o Orbital mechanics overview
  o Some specific orbits: geostationary orbit, sun-synchronous orbit etc.
  o Space environment and constraints

• Key mission components
  o Space segment architecture: platform and payload
  o Ground and launch segment
  o Mission operations

• Key applications and system design
  o Type of mission and objectives
  o System design drivers

COURSE DIRECTOR

• Mr. Olivier MURET, Senior Consultant and Satellite Systems Expert, Satconsult
OBJECTIVE

• The objective of this course is to outline the various specific characteristics of the space environment and related constraints.
• Upon completion of this course, trainees will have learned the key basics to be considered during the design and developmental phases of any space project.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree).

TOPICS COVERED

• Space environment
  o Key space environment characteristics (vacuum, radiation, thermal cycles, etc.)
  o Orbital mechanics
• Space constraints
  o Launch constraints (mechanical loads, thermal and electromagnetic environment)
  o Effects of orbital perturbations on spacecraft
  o Effects of the space environment on materials and electrical components
• Implications for spacecraft design
  o On-board thermal regulation
  o Electronic hardening
  o Orbit determination and control
  o Mechanical testing

RELATED MODULES

To be mastered To go further Connected with
1.1 1.3, 1.4, 1.8 3.5

TYPICAL DURATION & FORMAT

• 1 day (8 hours)
• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult
The objective of this course is to describe and explain the sequence and logic of the design, integration and test of a satellite system, outlining the various specific characteristics and related constraints of each phase.

Upon completion of this course, trainees will have learned the key basics of satellite system design, integration and test sequence.

In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree).

Program phase breakdown
- Phase A: Conceptual design
- Phase B: Definition
- Phase C: Design
- Phase D: Development, integration and verification
- Phase E: Operation

Design phase
- Design phase
- Mission definition
- Payload/platform sizing
- Satellite definition/satellite budgets
- Ground control segment definition
- Conclusion

Integration & test phases
- Foreword and general rules
- Verification program, method and techniques
- Verification phases
- Integration and test sequence
- Typical test sequence (unit/spacecraft, system)

Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult

To be mastered

1.1

To go further

1.4 to 1.8

Connected with

2.1, 2.6, 4.3

• 2 days (16 hours)
• Face-to-face or online delivery

Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult
OBJECTIVE

• The objective of this course is to present what constitutes a satellite platform and outline the main characteristics of the various constitutive subsystems.

• Upon completion of this course, trainees will have learned the key basics of what constitutes and drives a satellite platform.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree).

TOPICS COVERED

• Platform system overview
  o Platform purpose
  o From mission requirements to platform requirements

• Constitutive subsystems
  o Structure subsystem
  o Thermal subsystem
  o Mechanisms
  o Attitude & orbit determination & control subsystem
  o Propulsion subsystem
  o Electrical power subsystem
  o Telemetry & telecommand subsystem

• Platform products typology
  o Type of orbits
  o Mass and power range

RELATED MODULES

<table>
<thead>
<tr>
<th>To be mastered</th>
<th>To go further</th>
<th>Connected with</th>
</tr>
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<tbody>
<tr>
<td>1.1, 1.3</td>
<td>1.5 to 1.8</td>
<td>4.3</td>
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</table>

TYPICAL DURATION & FORMAT

• 2 days (16 hours)
• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult
OBJECTIVE

• The objective of this course is to outline the fundamentals of the product assurance in the framework of a satellite manufacturing project.

• Upon completion of this course, trainees will have learned about the best practices and typical requirements in dealing with product assurance activities in a satellite program.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a technical background (meaning either master level or engineering degree).

RELATED MODULES

<table>
<thead>
<tr>
<th>To be mastered</th>
<th>To go further</th>
<th>Connected with</th>
</tr>
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<tbody>
<tr>
<td>1.1</td>
<td>n/a</td>
<td>n/a</td>
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</tbody>
</table>

TYPICAL DURATION & FORMAT

• 1 day (8 hours)

• Face-to-face or online delivery

TOPICS COVERED

• Objectives and commitments of product assurance

• Space product assurance major requirements: System, environment, lifetime

• Reliability considerations: reliability, FMECA, safety

• Product assurance domains: parts; materials and processes; quality control

• Space product assurance programmatic aspects: Development and manufacturing control, subcontractor product assurance

• Space product assurance within program management organization: product assurance plan, audit, progress report

• Risk and nonconformance management

COURSE DIRECTOR

• Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult

TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.5: QUALITY CONTROL & ASSURANCE
OBJECTIVE

• The objective of this course is to present the basics of a launch vehicle and outline the various specific characteristics of the related constraints imposed to interface with the satellite.

• Upon completion of this course, trainees will have learned the basics of a launch vehicle and the keys items to be considered regarding the launcher/satellite interface.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree).

RELATED MODULES

To be mastered | To go further | Connected with
--- | --- | ---
1.1 to 1.3 | 1.7, 1.8 | 4.3

TOPICS COVERED

• Introduction to launch vehicles
  o Objectives & principles
    • Space transportation
    • Rocket principles & some physics (action reaction, jet engine, staging)
  o Overview of the design & key features
    • Propulsion (types, performances)
    • Guidance/piloting
    • Other services (telemetry, pyro system)
    • Safety, flight termination
    • Launch pad and launch preparation
  o Effect on the satellite: launch environment

• Launcher mission analysis: interface design and verification
  o Electrical, EMC
  o Thermal
  o Mechanical (clearance, static and dynamic loads etc.)
  o Trajectory, separation, collision avoidance

TYPICAL DURATION & FORMAT

• 1 to 2 days (8-16 hours)
• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult
**OBJECTIVE**

- The objective of this course is to describe the various phases of a satellite launch campaign outlining its characteristics and related constraints.
- Upon completion of this course, trainees will have learned the key basics of a satellite launch campaign.

**PREREQUISITES**

- In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree).

**RELATED MODULES**

<table>
<thead>
<tr>
<th>To be mastered</th>
<th>To go further</th>
<th>Connected with</th>
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<tr>
<td>1.1, 1.6</td>
<td>1.8</td>
<td>3.5</td>
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**TYPICAL DURATION & FORMAT**

- 0.5 day (4 hours)
- Face-to-face or online delivery

**TOPICS COVERED**

- **Introduction**
  - Objectives: Why a launch campaign?
  - Organization: a challenge of synchronization
- **Launch campaign**
  - Preparation (operations, logistics, safety submission)
  - Transportation to launch site
  - Autonomous preparation to launch (satellite, launch pad, launcher)
  - Combined operations
  - Dress rehearsal
- **Launch**
  - Launch countdown
  - From lift-off to separation

**COURSE DIRECTOR**

- Mr. Vincent ASTIER, Senior Project Manager and Platform/Launch Systems Expert, Satconsult
OBJECTIVE

• The objective of this course is to review the various phases of a satellite launch campaign outlining its characteristics and related constraints.

• Upon completion of this course, trainees will have learned the key basics of a satellite launch campaign.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree)

RELATED MODULES

To be mastered  
To go further  
Connected with  
1.1  
3.5

TOPICS COVERED

• Orbit-Raising and insertion operations
  o Possible Orbit-Raising mission overview and strategy
  o Control instances, coordination and separation
  o Orbit-Raising & insertion phase

• In-orbit testing
  o Platform testing (attitude, currents and temperature monitoring)
  o Payload testing (telecom and EO illustrations)

• On-station operations
  o Orbit control operations (AOCS, maneuvers, etc.)
  o Resource-oriented operations & Mission Oriented Operations
  o Contingency operations (collision avoidance, degraded modes)

• Disposal operations
  o LEO, MEO, GEO strategies

COURSE DIRECTOR

• Mr. Yann LE DU, Technical Adviser, Satconsult
**OBJECTIVE**

- The objective of this course is to help trainees identify the role and definition of each component of a satellite communications system.

- Upon completion of this course, trainees will have a first-level knowledge on the necessary operational functions in a satellite communications system.

**PREREQUISITES**

- In order to take full advantage of this course, trainees should have a technical background (meaning either master level or an engineering degree). Some experience in the satellite sector is obviously a plus.

**RELATED MODULES**

- 1.1
- 1.10 to 1.13
- Connected with 3.1, 3.2, 3.4, 4.6

**TYPICAL DURATION & FORMAT**

- 1 day (8 hours)
- Face-to-face or online delivery

**TOPICS COVERED**

- Inventory and definition of satellite-based communications services
  - Raw capacity
  - Managed services
  - Managed capacity
  - End-to-end solutions

- The space segment
  - The satellite
  - Satellite control center
  - The frequency resource

- The mission ground segment
  - User terminals and RF gateways
  - The resource manager
  - Communication hubs
  - Network monitoring instances: The NMS and the CSM

**COURSE DIRECTOR**

- Mr. Yann LE DU, Technical Advisor, Satconsult
OBJECTIVE

• The objective of this course is to provide trainees with sufficient support to allow a global level of understanding of how a HTS or VHTS system operates.

• Upon completion of this course, trainees will have a good basis for further developing their skills in High Throughput communication systems.

PREREQUISITES

• In order to take full advantage of this course, trainees should have completed modules 1.1 and 1.9.

• Some experience in the satellite sector will obviously be a plus.

RELATED MODULES

To be mastered: 1.1, 1.9
To go further: 1.11, 1.12, 1.13
Connected with: 3.1, 3.2, 3.4, 4.6

TOPICS COVERED

• HTS/VHTS technology basics
  o Frequency reuse principles
  o Multisport coverages
  o Connectivity principles and network topologies
  o Gateways: number, sizing, location, redundancy, diversity
  o Bent pipe vs. digital HTS
  o Resource access techniques
  o Frequency resources specificities

• HTS and VHTS systems examples
  o Anik F2
  o Eutelsat Ka
  o VIASAT 3
  o O3B m-Power

TYPICAL DURATION & FORMAT

• 1 to 1.5 day (8-12 hours)
• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Yann LE DU, Technical Advisor, Satconsult
TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.11: SATELLITE COMMUNICATIONS SYSTEMS: FLEXIBLE & RECONFIGURABLE

OBJECTIVE

• The objective of this course is to give the trainees the key principles of this new generation of satellites. It will briefly cover the design details (still under development/protected data) of the solutions but will go more into detail of the pros and cons of the operations of such systems.

• Upon completion of this course, trainees will have a good knowledge of the advantages and constraints of such emerging solutions.

PREREQUISITES

• In order to take full advantage of this course, trainees should have some background in procurement and/or mission operation on satellite communications systems.

RELATED MODULES

To be mastered To go further Connected with
1.1, 1.9 1.10, 1.12, 1.13 3.1, 3.2, 3.4, 4.6

TOPICS COVERED

• Standard flexible satellite development
  o General principles
  o Procurement and development principles
  o High level design principles

• Standard flexible satellite operations
  o Ground infrastructure
  o Beam forming and transmission planning
  o Centralized resource and forecast scenarios

• Standard flexible satellite benchmarking
  o Standard flexible vs. conventional bent-pipe systems
  o Standard flexible vs. HTS/VHTS systems

TYPICAL DURATION & FORMAT

• 1 to 1.5 day (8-12 hours)
• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Yann LE DU, Technical Advisor, Satconsult
OBJECTIVE

• The objective of this course is to assist trainees in understanding the logic of design and principles of operations of a communication satellite constellation.

• Upon completion of this course, trainees will have reviewed the top-level characteristics of a satellite constellation, allowing a reasonable understanding of the inputs in such development trade-offs.

PREREQUISITES

• In order to take full advantage of this course, trainees should have some background in procurement and/or mission operations on Satcom systems

• Some experience in the satellite sector will obviously be a plus.

RELATED MODULES

To be mastered To go further Connected with
1.1, 1.9 1.10, 1.11, 1.13 3.1, 3.2, 3.4, 4.6

TYPICAL DURATION & FORMAT

• 1 to 1.5 day (8-12 hours)

• Face-to-face or online delivery

TOPICS COVERED

• LEO constellation system parameters
  o Main parameters (orbit, number of satellites, user terminals, size of satellites, gateways, inter-satellite links, frequency resources, launch concept…)
  o Frequency resource for a non-GSO system
  o Key principles to develop a high-level design addressing a telecommunication service

• Various constellation systems panorama
  o Globalstar/Iridium (telephony)
  o O3B (access)
  o Starlink
  o OneWeb
  o Telesat Vantage
  o LEO constellations benchmarking

COURSE DIRECTOR

• Mr. Yann LE DU, Technical Advisor, Satconsult
The objective of this course is to provide trainees with the various operational concepts that are in place for each of the main satcom business models, from raw capacity delivery to end-to-end services.

Upon completion of this course, trainees will have a first-level understanding of the way a satcom system is operated, through the communication flows between each component.

In order to take full advantage of this course, trainees should have some background in procurement and/or mission operation of satcom systems.

Some experience in the satellite sector will obviously be a plus.

Planning process
  - Operator roadmap
  - RF planning

Deployment process
  - Terminals and hub procurement
  - Terminals logistic chain: from factory to field operations

The network operation process
  - RF operations surveyance
  - QoS monitoring
  - Service level agreement

Mission operation versus business models
  - Raw capacity services operations
  - Managed services operations
  - Managed capacity operations
  - End-to-end solutions operations

1 day (8 hours)

Face-to-face or online delivery

Mr. Yann LE DU, Technical Advisor, Satconsult
**OBJECTIVE**

- The objective of this course is to outline the purpose of satellite Earth observation from an end-user’s perspective and requirements achieved through dedicated technical solutions.
- Upon completion of this course, trainees will have learned what constitutes the overall philosophy and means for satellite Earth observation.

**PREREQUISITES**

- In order to take full advantage of this course, trainees should have a background in engineering (optical, radio communications, electronics, software, etc.) and/or Geographic Information Systems.

**RELATED MODULES**

- **To be mastered**: 1.1
- **To go further**: 1.15, 1.16
- **Connected with**: 3.1, 3.3, 4.7

**TOPICS COVERED**

- **Missions**
  - Environment (meteorology, agriculture, forestry, etc.)
  - Intelligence (economic, security, defense)

- **Main parameters/drivers**
  - Main characteristics of the observation targets (size, frequency of occurrence, wavelength of observability)
  - Design drivers (revisit, resolution, wavelength, day/night, all weather, local, global, tasking cycle)
  - Going from requirements to launch and operations

- **System architecture**
  - Space segment (number of satellites, orbits, agility, …)
  - Ground segment (stations, ISL, processing, dissemination)

- **Technologies**
  - Optical (MSI, HSI), radar (imagery, altimetry), lidar,
  - Connected systems: Geoint, Sigint

**TYPICAL DURATION & FORMAT**

- 1.5 to 2 days (12-16 hours)
- Face-to-face or online delivery

**COURSE DIRECTOR**

- Mr. Olivier THEPAUT or Mr. Jérôme COLINAS, Senior Project Managers and Earth Observation Experts, Satconsult
OBJECTIVE

• The objective of this course is to outline the optical imager principles, techniques and technologies.

• Upon completion of this course, trainees will have learned general optical image concepts and specific applications and associated technologies.

PREREQUISITES

• In order to take full advantage of this course, trainees should have a background in engineering (optical, radio communications, electronics, software, etc.) and/or Geographic Information Systems.

RELATED MODULES

To be mastered

1.1, 1.14

To go further

1.16

Connected with

3.1, 3.3, 4.7

TOPICS COVERED

• Optical image principles
  o Image geometry
  o Radiometric aspects
  o Image acquisition and processing

• Key sizing parameters
  o Agility, swath, on-bord storage
  o Frequency bands (visible, NIR, SWIR, …), spatial resolution
  o Modulation Transfer Function, Signal-to-Noise Ratio
  o Other key sizing parameters (data rate, tasking cycle, onboard processing)

• System architecture
  o From users’ requirements/parameters to system design (space and ground segment) design
  o Illustrations with operated missions or future concepts

TYPICAL DURATION & FORMAT

• 1 to 1.5 day (8-12 hours)

• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Olivier THEPAUT or Mr. Jérôme COLINAS, Senior Project Managers and Earth Observation Experts, Satconsult
**OBJECTIVE**

- The objective of this course is to outline the radar (or SAR) imager principles, techniques and technologies.
- Upon completion of this course, trainees will have a general knowledge of radar (or SAR) image concepts and specific applications and associated technologies.

**PREREQUISITES**

- In order to take full advantage of this course, trainees should have a background in engineering (optical, radio communications, electronics, software, etc.) and/or Geographic Information Systems.

**RELATED MODULES**

- To be mastered: 1.1, 1.14
- To go further: 1.15
- Connected with: 3.1, 3.3, 4.7

**TOPICS COVERED**

- **SAR image principles**
  - SLAR and SAR geometry
  - SAR azimuth and range ambiguities
- **Key sizing parameters**
  - Minimum antenna area and maximum merit factor
  - Radar equation and power sizing
  - Other key sizing parameters (datarate, tasking cycle)
- **Advanced modes and architectures**
  - ScanSAR, spotlight, multibeam, reflector
  - Monostatic, bistatic (single sat, dual sat), multistatic (sat train)
- **Program approach**
  - From users’ requirements/parameters to system design (space and ground segment) design
  - Illustrations with operated missions or future concepts

**TYPICAL DURATION & FORMAT**

- 1 to 1.5 day (8-12 hours)
- Face-to-face or online delivery

**COURSE DIRECTOR**

- Mr. Olivier THEPAUT or Mr. Jérôme COLINAS, Senior Project Managers and Earth Observation Experts, Satconsult
OBJECTIVE

• The objective of this course is to outline the various professions found in the space sector and associated skills.

• Upon completion of this course, trainees will have acquired a high-level of understanding of typical training paths to follow in the space sector, be it to consolidate, refresh or create related capacity building programs.

PREREQUISITES

• No higher education degree (neither technical nor business) required.

RELATED MODULES

To be mastered

1.1, 1.2, 2.1

To go further

2.2 to 2.7, 3.1, 3.4, 4.1

Connected with

TOPICS COVERED

• Reminder of the space sector’s value chain
  o Upstream activities and players
  o Downstream activities and players

• Professions in the space sector
  o Technical & engineering professions
  o Business planning & development professions
  o Program management professions
  o Other professions

• Required skills in the space sector
  o Technical & engineering skills
  o Business planning & development
  o Program management skills
  o Other skills

• Examples of typical capacity building programs

TYPICAL DURATION & FORMAT

• 0.5 day (4 hours)

• Face-to-face or online delivery

COURSE DIRECTOR

• Mr. Pierre VALENTI, Senior Affiliate, Euroconsult
Pierre VALENTI has spent most of his 25-year career in the space sector, leveraging a proven track record and practical knowledge of all key functions associated with marketing and sales at large including business planning and development, business intelligence and market research.

His previous experience includes a ten-year tenure (1999-2009) as Marketing & Sales Manager with the Telecommunications Satellites business unit of Airbus Defense & Space, Space Systems. He also acted as Arianespace’s Marketing Director from 2009 to 2011.

In addition to this solid industrial experience, Mr. VALENTI also worked for such renowned consultancies as Accenture (1994-1996), Euroconsult (1996-1998) and Satconsult (2011-2012). More recently, he served as Deputy Managing Director (2012-2013), then Managing Director (2014-2019) of the Institut Aéronautique & Spatial (IAS), a training agency operating under the French Aerospace Industries Association. In 2020, he decided to join forces with Euroconsult to develop a dedicated training service offer.

Mr. VALENTI is a French national born in Paris in 1968. He has been based and working in Toulouse since 2001.
CONTENTS

Our Training Service Offer In A Nutshell

Topic 1: Space technical & engineering fundamentals

Contact Information

Euroconsult Group Presentation
Euroconsult Group is the leading global consulting group specializing in the space sector and satellite enabled verticals.

- Privately owned
- Fully independent
- 40 years of experience
- 5 global locations
- 600 clients
- A team of over 100 multidisciplinary experts
FOUR COMPLEMENTARY ACTIVITIES

- Unique model with synergies and complementarity of our four activities
- End-to-end capability in support of our partners and clients
- Strict separation of information and respect of confidential client information.

TAILORED CONSULTING SERVICES

THEMATIC RESEARCH PRODUCTS

THEMATIC TRAINING

EXECUTIVE SUMMITS
EUROCONSULT IN A NUTSHELL

- ~80 consulting missions in >20 countries every year
- 15 market studies every year
- 600 clients for the range of our products and services
- >1000 participants to the World Satellite Business Week
- 3 million data point collected and maintained on the market
- 85% of our activity dedicated to export
- 100 experts in 5 countries
- 100% independent
- 100% dedicated to the space sector

3 million data point collected and maintained on the market
Our expertise and skills enable us to focus on the unique requirements of each of our projects.

Our independence guarantees our commitment to optimize value creation for our clients.
OUR CLIENTS

600 clients in 50 countries – 5 global locations

- Government
- Financial institutions
- Service providers
- Satellite operators
- End-users
- Manufacturers
- Launch service providers

Countries in which clients are based
Office locations
Representatives
OUR LEADERSHIP

Pacôme Révillon  
CEO  
Euroconsult CEO since 2004  
20 years of experience in strategic and financial oriented process in the space industry

Steve Bochinger  
COO  
Part of EC Executive team since 2004  
20 years of experience; lead role for institutional and industrial affairs

David Chégnion  
Managing Director, Satconsult  
Satconsult MD since 2018  
25 years of experience in the space industry, with executive positions in leading aerospace groups

Lorraine Whitfield  
Chief Events & Marketing Officer  
Part of EC Executive team since 2008  
20 years of experience in events organization, marketing and sales

Nathan de Ruiter  
Managing Director, Canada  
Part of EC Executive team since 2008  
15 years of experience in strategic and financial oriented process

Susan Irwin  
Managing Director, USA  
Part of EC Executive team since 2010, 35 years of experience in the telecom and space industry

Experienced & international management team

Laurent Valignon  
VP Business Development, Satconsult  
Part of SATC Executive team since 2008  
20 years of experience in the space sector