

INTRODUCING THE EUROCONSULT GROUP SPACE TRAINING SERVICE OFFER

2020 | 2021





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- Our Training Service Offer In A Nutshell
- Our Training Service Offer In Detail
- 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:
 - 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
 - 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:
 - Fostering inherent skills and a buildup of how-how
 - Gaining independence
 - 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



GENERAL SERVICE APPROACH (2/2)

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



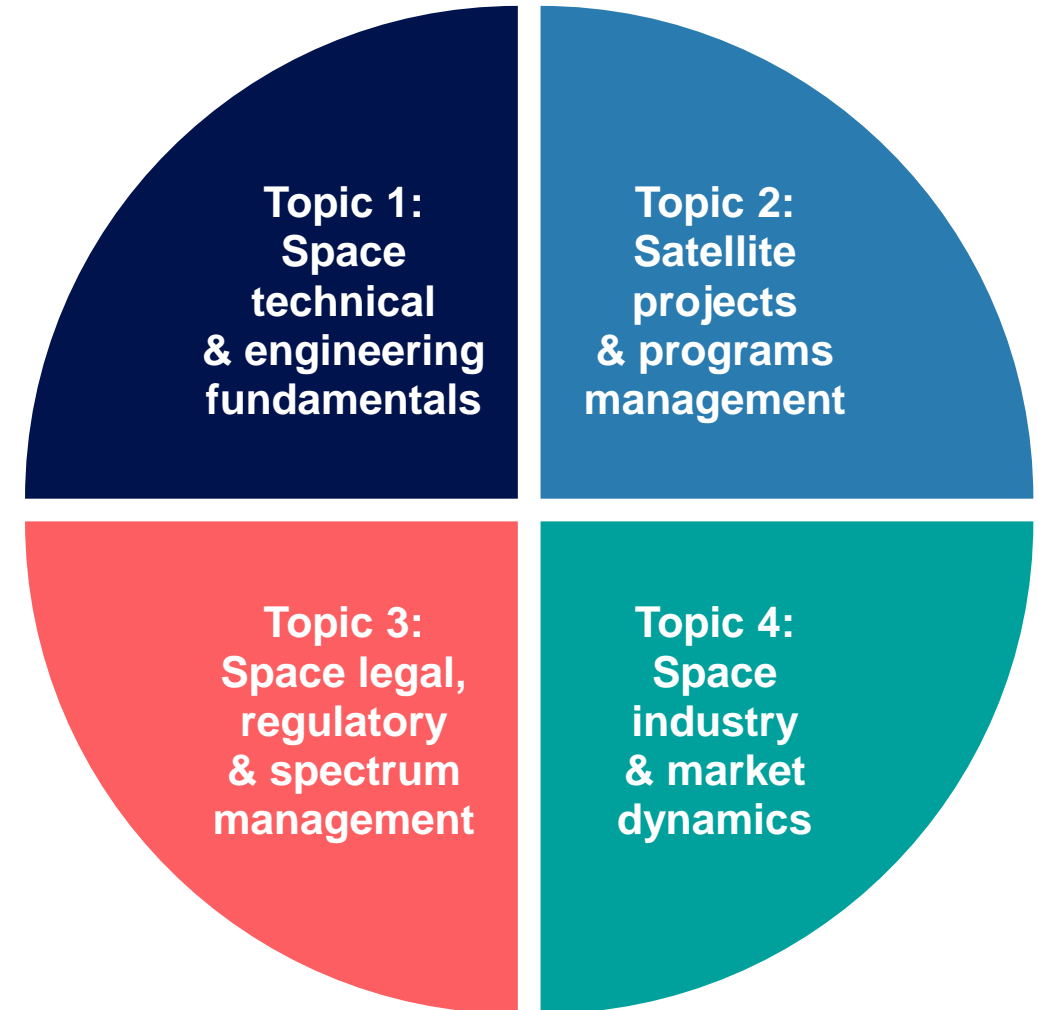
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FROM TRAINING TOPICS TO DELIVERY MODES

- 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.:
 - Space technical & engineering fundamentals
 - Satellite projects & programs management
 - Space legal, regulatory and spectrum management
 - Space industry & market dynamics
- ...available in **two alternative delivery modes** depending upon customer objectives, requirements, and constraints, i.e.:
 - Pre-packaged
 - Customized





TRAINING CATALOG OVERVIEW

	Topic 1: Space technical & engineering fundamentals	Topic 2: Satellite projects & programs management	Topic 3: Space legal, regulatory & spectrum management	Topic 4: Space industry & market dynamics
Nb. of training modules	17	7	5	9
Typical module duration range*	0.5 to 2 days	0.5 to 2 days	1 to 3 days	1 to 2 days
Typical contents	End-to-end technical and engineering space industry fundamentals	Space program management topics, from business planning to risk management assessment	Legal, regulatory and frequency challenges impacting business plans, investment and programs	Space industry policy and market perspectives and trends
Available delivery formats	Face-to-face or online	Face-to-face or online	Face-to-face or online	Face-to-face or online

* Depending upon customer objectives, requirements, and constraints.



TRAINING CATALOG DETAILS

- Structured along a topic-by-topic basis, the following slides provide **an overview of each of our 38 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



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

1.2 to 1.17

2.1, 3.1, 4.1

TYPICAL DURATION & FORMAT

- 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**
 - Orbital mechanics overview
 - Some specific orbits: geostationary orbit, sun-synchronous orbit etc.
 - Space environment and constraints
- **Key mission components**
 - Space segment architecture: platform and payload
 - Ground and launch segment
 - Mission operations
- **Key applications and system design**
 - Type of mission and objectives
 - System design drivers

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.2: SPACE ENVIRONMENT & ASSOCIATED CONSTRAINTS

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).

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

TOPICS COVERED

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

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.3: SATELLITE SYSTEM DESIGN, INTEGRATION & TESTS

OBJECTIVE

- 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.

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	1.4 to 1.8	2.1, 2.6, 4.3

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **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)

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.4: SATELLITE PLATFORM & SUBSYSTEMS

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).

RELATED MODULES

To be mastered	To go further	Connected with
1.1, 1.3	1.5 to 1.8	4.3

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Platform system overview**
 - Platform purpose
 - From mission requirements to platform requirements
- **Constitutive subsystems**
 - Structure subsystem
 - Thermal subsystem
 - Mechanisms
 - Attitude & orbit determination & control subsystem
 - Propulsion subsystem
 - Electrical power subsystem
 - Telemetry & telecommand subsystem
- **Platform products typology**
 - Type of orbits
 - Mass and power range

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 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

To be mastered	To go further	Connected with
1.1	n/a	n/a

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 1.6: LAUNCH VEHICLES & SATELLITE/LAUNCHER INTERFACES

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

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Introduction to launch vehicles**
 - Objectives & principles
 - Space transportation
 - Rocket principles & some physics (action reaction, jet engine, staging)
 - Overview of the design & key features
 - Propulsion (types, performances)
 - Guidance/piloting
 - Other services (telemetry, pyro system)
 - Safety, flight termination
 - Launch pad and launch preparation
 - Effect on the satellite: launch environment
- **Launcher mission analysis: interface design and verification**
 - Electrical, EMC
 - Thermal
 - Mechanical (clearance, static and dynamic loads etc.)
 - Trajectory, separation, collision avoidance

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.7: LAUNCH CAMPAIGN & LAUNCH PHASE

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

To be mastered	To go further	Connected with
1.1, 1.6	1.8	3.5

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.8: SATELLITE CONTROL OPERATIONS: FROM DEPLOYMENT TO DEORBITATION

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

1.1

To go further

Connected with

3.5

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Orbit-Raising and insertion operations**
 - Possible Orbit-Raising mission overview and strategy
 - Control instances, coordination and separation
 - Orbit-Raising & insertion phase
- **In-orbit testing**
 - Platform testing (attitude, currents and temperature monitoring)
 - Payload testing (telecom and EO illustrations)
- **On-station operations**
 - Orbit control operations (AOCS, maneuvers, etc.)
 - Resource-oriented operations & Mission Oriented Operations
 - Contingency operations (collision avoidance, degraded modes)
- **Disposal operations**
 - LEO, MEO, GEO strategies

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Adviser, Satconsult



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.9: SATELLITE COMMUNICATIONS SYSTEMS OVERVIEW

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

To be mastered	To go further	Connected with
1.1	1.10 to 1.13	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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.10: SATELLITE COMMUNICATIONS SYSTEMS: HIGH THROUGHPUT SYSTEMS

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	To go further	Connected with
1.1, 1.9	1.11, 1.12, 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

- **HTS/VHTS technology basics**
 - Frequency reuse principles
 - Multispot coverages
 - Connectivity principles and network topologies
 - Gateways: number, sizing, location, redundancy, diversity
 - Bent pipe vs. digital HTS
 - Resource access techniques
 - Frequency resources specificities
- **HTS and VHTS systems examples**
 - Anik F2
 - Eutelsat Ka
 - VIASAT 3
 - O3B m-Power

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

1.1, 1.9

To go further

1.10, 1.12, 1.13

Connected with

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

- **Standard flexible satellite development**
 - General principles
 - Procurement and development principles
 - High level design principles
- **Standard flexible satellite operations**
 - Ground infrastructure
 - Beam forming and transmission planning
 - Centralized resource and forecast scenarios
- **Standard flexible satellite benchmarking**
 - Standard flexible vs. conventional bent-pipe systems
 - Standard flexible vs. HTS/VHTS systems

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Advisor, Satconsult



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.12: SATELLITE COMMUNICATIONS SYSTEMS: CONSTELLATION SYSTEMS

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**
 - Main parameters (orbit, number of satellites, user terminals, size of satellites, gateways, inter-satellite links, frequency resources, launch concept...)
 - Frequency resource for a non-GSO system
 - Key principles to develop a high-level design addressing a telecommunication service
- **Various constellation systems panorama**
 - Globalstar/Iridium (telephony)
 - O3B (access)
 - Starlink
 - OneWeb
 - Telesat Vantage
 - LEO constellations benchmarking

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Advisor, Satconsult



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.13: TELECOM SATELLITE MISSIONS OPERATIONS

OBJECTIVE

- 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.

PREREQUISITES

- 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.

RELATED MODULES

To be mastered	To go further	Connected with
1.1, 1.9	1.10, 1.11, 1.12	3.1, 3.2, 3.4, 4.6

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **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

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Advisor, Satconsult



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.14: SATELLITE EARTH OBSERVATION SYSTEMS OVERVIEW

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	To go further	Connected with
1.1	1.15, 1.16	3.1, 3.3, 4.7

TYPICAL DURATION & FORMAT

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

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

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.15: SATELLITE OPTICAL EARTH OBSERVATION SYSTEMS

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	To go further	Connected with
1.1, 1.14	1.16	3.1, 3.3, 4.7

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Optical image principles**
 - Image geometry
 - Radiometric aspects
 - Image acquisition and processing
- **Key sizing parameters**
 - Agility, swath, on-board storage
 - Frequency bands (visible, NIR, SWIR, ...), spatial resolution
 - Modulation Transfer Function, Signal-to-Noise Ratio
 - Other key sizing parameters (data rate, tasking cycle, onboard processing)
- **System architecture**
 - From users' requirements/parameters to system design (space and ground segment) design
 - Illustrations with operated missions or future concepts

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.16: SATELLITE RADAR EARTH OBSERVATION SYSTEMS

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	To go further	Connected with
1.1, 1.14	1.15	3.1, 3.3, 4.7

TYPICAL DURATION & FORMAT

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

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

COURSE DIRECTOR

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



TOPIC 1: SPACE TECHNICAL & ENGINEERING FUNDAMENTALS

MODULE 1.17: SPACE SECTOR'S PROFESSIONS & SKILLS

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

Connected with

2.2 to 2.7, 3.1, 3.4, 4.1

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Reminder of the space sector's value chain**
 - Upstream activities and players
 - Downstream activities and players
 - **Professions in the space sector**
 - Technical & engineering professions
 - Business planning & development professions
 - Program management professions
 - Other professions
 - **Required skills in the space sector**
 - Technical & engineering skills
 - Business planning & development
 - Program management skills
 - Other skills
 - **Examples of typical capacity building programs**
- ### COURSE DIRECTOR
- Mr. Pierre VALENTI, Senior Affiliate, Euroconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

TRAINING MODULES LIST

- 2.1 Satellite mission technical roadmap: from concept to operations
- 2.2 Satellite project business plan definition
- 2.3 Satellite project financing
- 2.4 Satellite program tender management
- 2.5 Satellite program contract negotiations & management
- 2.6 Satellite industrial contract management
- 2.7 Satellite program risk management & insurance



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.1: SATELLITE MISSION TECHNICAL ROADMAP: FROM CONCEPT TO OPERATIONS

OBJECTIVE

- This course will propose a complete roadmap for the development of a satellite system
- Upon completion of this course, trainees will understand the general process to be conducted for the end-to-end development of such a system, including design, procurement, integration, deployment and validation phases.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of a space systems' architecture and operational concept, related contract negotiations and management of its development follow-up.

RELATED MODULES

To be mastered

To go further

Connected with

2.2 to 2.7

1.1, 3.1, 4.1

TYPICAL DURATION & FORMAT

- 0.5 to 1 day (4-8 hours)
- Face-to-face or online delivery

TOPICS COVERED

- **General program conduction roadmap**
 - High-level program development timeline
 - High-level description of each phase
- **Project feasibility phase**
 - Business assessment
 - Regulatory assessment
 - Technical feasibility, architecture and cost estimate
 - Business models definition
- **Procurement phase**
 - Contractual breakdown
 - Tender development
- **Development, deployment and verification phase**
 - Development monitoring scheme
 - Progressive validation principles

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Advisor, Satconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.2: SATELLITE PROJECT BUSINESS PLAN DEFINITION

OBJECTIVE

- This course will include a review of the key elements to support the development of a business plan. Versions of this module will be based on the type of satellite activity (such as connectivity, earth observation)
- Upon completion of the course, trainees will have acquired the skill to develop a business plan for the satellite project including financial forecasts

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of space systems and services, and of economics and financial metrics.

RELATED MODULES

To be mastered

2.1

To go further

2.2 to 2.7

Connected with

1.3, 4.6, 4.7

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **General business plan development roadmap**
 - High level Business Plan development timeline
 - High level description of each phase
- **Market assessment and top line assessment**
 - Assessing demand dynamics in target markets
 - Competitive assessment
 - Business Models definition
 - Market prioritization and revenue forecast
- **Capital expenditure and operating costs**
 - Capex components with main principles
 - Review of the main components of the operating costs
- **Financial modelling, financial structuring**
 - Revenue and cash flow modelling
 - Profitability performance ratios

COURSE DIRECTOR

- Mr. Nathan DE RUITER, Managing Director, Euroconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.3: SATELLITE PROJECT FINANCING

OBJECTIVE

- This course will complete the module on the business plan development. It will focus on the usual structuring of a satellite financing process.
- Upon completion of the course, trainees will have acquired the full understanding on financing processes for satellite programs

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of space programs, of economics and financial metrics, of balance sheet principles and on general sources of financing

RELATED MODULES

To be mastered

2.1, 2.2

To go further

2.3 to 2.7

Connected with

TYPICAL DURATION & FORMAT

- 0.5-1 day (4-8 hours)
- Face-to-face or on-line delivery

TOPICS COVERED

- **Overview of potential sources of financing**
 - Typical sources of financing vs. the type of program
 - Overview of the general process
 - Review of a potential financial roadmap
- **Equity raising**
 - Typical financing rounds for satellite programs
 - Key success factors and typical conditions
- **Debt raising**
 - Main sources of debt financing, including export credit
 - Process review and key success factors
- **Other options for financing and capex optimization**
 - Strategic partnership with a third party on the satellite system
 - Other forms of structured transactions

COURSE DIRECTOR

- Mr. Nathan DE RUITER, Managing Director, Euroconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.4: SATELLITE PROGRAM TENDER MANAGEMENT

OBJECTIVE

- The objective of this course is to outline the main principles and specifics unique to satellite system procurement.
- Upon completion of this course, trainees will understand the key capabilities to structure and run a satellite program tender phase.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of a space system's architecture, satellite program contract negotiations and management, as well as a space system's development logic.

RELATED MODULES

To be mastered

2.1

To go further

2.2, 2.3, 2.5, 2.6, 2.7

Connected with

TYPICAL DURATION & FORMAT

- 0.5 to 1 day (4-8 hours)
- Face-to-face or online delivery

TOPICS COVERED

- **Introduction to the procurement process**
 - Upstream phases: from concept to feasibility assessment
 - The role of the Request for Information (RFI)
- **Tender phase preparation**
 - Tender type: from negotiated to open tender
 - Preparation of a Request for Proposal (RFP) package
 - Key components (contract, statement of work, technical appendices, instruction to bidders)
 - Tender planning
 - Defining the tender evaluation and shortlisting process
- **Managing the tender**
 - Main phases
 - Interactions with bidders
 - Evaluation, ranking and down selection
 - Negotiation phase: the role of BAFO and negotiation rounds

COURSE DIRECTOR

- Mr. Laurent VALIGNON, VP Business Development and Program Management, Satconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.5: SATELLITE PROGRAM CONTRACT NEGOTIATIONS & MANAGEMENT

OBJECTIVE

- The objective of this course is to outline the main principles and specifics unique to satellite and launch services contracts.
- Upon completion of this course, trainees will have acquired the capabilities to steer the performance of a project based on an international turnkey contract.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of a space system's architecture, management, and development logic

RELATED MODULES

To be mastered

2.1

To go further

2.2, 2.3, 2.4, 2.6, 2.7

Connected with

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Structure of a satellite contract**
 - Types of contracts
 - The concept of “turnkey contracts”
 - What a contract must say
 - Three key concepts
 - Summary of contract terms
 - Contract and project performance
 - Signature and EDC
- **Satellite contract management**
 - Everything goes smoothly
 - In the event a party cannot fulfil its obligations
- **Launch services contract overview**

COURSE DIRECTOR

- Mr. Jean-Pierre NOTE, Contract and Risk Management Expert, Satconsult



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.6: SATELLITE INDUSTRIAL CONTRACT MANAGEMENT

OBJECTIVE

- The objective of this course is to outline the main principles and specifics pertaining to the management of the manufacturing phase of a space program
- Upon completion of this course, trainees will have acquired the main principles and best practices applied in the frame of the management of the design, construction and deployment of a space program

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of a space system's architecture, satellite program contract negotiations and management, as well as a space system's development logic

RELATED MODULES

To be mastered

2.1

To go further

2.2, 2.3, 2.4, 2.5, 2.7

Connected with

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Introduction to a satellite program**
- **Procurement and main contract**
- **Organization**
 - Company & program
 - Work breakdown structure
 - Program management plan
- **Management**
 - Delegation, reporting, decision process
 - Program phase: meetings and reviews
 - Mission quality and performance
 - Schedule & cost management
 - Risk management
 - Monitoring of human relationships, external suppliers, anomalies, interfaces, contractual change notices, deviations, waivers, etc.

COURSE DIRECTOR

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



TOPIC 2: SATELLITE PROJECTS & PROGRAMS MANAGEMENT

MODULE 2.7: SATELLITE PROGRAM RISK MANAGEMENT & INSURANCE

OBJECTIVE

- The objective of this course is to outline the main principles of satellite program risk management and space program insurance.
- Upon completion of this course, trainees will have learned the fundamentals of satellite project risk management, insurance organization, players, services and operational management.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of a space system's architecture and development logic.

RELATED MODULES

To be mastered

2.1, 2.5, 2.6

To go further

2.2, 2.3, 2.4

Connected with

TYPICAL DURATION & FORMAT

- 0.5 to 1 day (4-8 hours)
- Face-to-face or online delivery

TOPICS COVERED

- **Risks to be covered**
- **Satellite project risk management**
 - Typology of risks
 - Risk management strategies
 - Risks associated with project phases
- **Space insurance market**
- **Factors impacting the insurance cost**
- **Operational approach**
 - Broker selection
 - Risk management strategy
 - Insurance coverage
- **Case studies**

COURSE DIRECTOR

- Mr. Jean-Pierre NOTE, Contract and Risk Management Expert, Satconsult



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

TRAINING MODULES LIST

- 3.1 Introduction to space laws and regulations
- 3.2 Satellite communications regulation
- 3.3 Satellite Earth observation regulation
- 3.4 Orbital resources: regulation and management
- 3.5 Orbital debris: regulation and management



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

MODULE 3.1: INTRODUCTION TO SPACE LAWS & REGULATIONS

OBJECTIVE

- The objective of this course is to provide an overall understanding of the legal and regulatory context of space activities.
- Upon completion of this course, trainees will have learned the fundamentals of international and national regulations to be considered when implementing space projects.

PREREQUISITES

- No specific prerequisites. This course is an overview of space laws and regulations for trainees with no legal background.

RELATED MODULES

To be mastered

To go further

Connected with

3.2 to 3.5

1.1, 2.1, 4.1

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **International space law**
 - Process for establishing international space laws
 - Main principles introduced through Outer Space Treaties: non-appropriation, peaceful uses, freedom of Outer Space, protection of environment, jurisdiction, control, responsibility, liability
- **National space law**
 - Five building blocks: authorization, supervision of space activities, state indemnification, state liability, registration of space objects
 - Main disparities between national space regulations
- **Export control**
 - International transfer of military and sensitive goods/technologies with a focus on U.S. regulations

COURSE DIRECTOR

- Mr. Philippe ACHILLEAS, Professor of Space & Telecom Law, University Paris-Saclay



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

MODULE 3.2: SATELLITE COMMUNICATIONS REGULATION

OBJECTIVE

- The objective of this course is to provide an overview of international and national regulations related to satellite telecommunications.
- Upon completion of this course, trainees will have acquired a complete understanding of the regulatory environment and processes applicable to satellite telecommunications systems and services.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of general space law.

RELATED MODULES

To be mastered

3.1, 3.4

To go further

3.3 to 3.5

Connected with

1.9 to 1.13

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **International framework**
 - ITU organization, regulatory framework (ITU-R, ITU-T, ITU-D) and main principles adopted
 - Frequency allocation/allotment
 - Regional coordination
 - International trade
 - EU regulatory framework
- **National regulations**
 - National regulations and conditions to obtain licenses
 - Processes related to frequency assignment
 - Terminal equipment regulations
- **Current challenges**
 - NGSO mega-constellations
 - 5G

COURSE DIRECTOR

- Mr. Philippe ACHILLEAS, Professor of Space & Telecom Law, University Paris-Saclay



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

MODULE 3.3: SATELLITE EARTH OBSERVATION REGULATION

OBJECTIVE

- The objective of this course is to outline the various regulations related to Earth observation activities.
- Upon completion of this course, trainees will have acquired a complete understanding of the regulatory environment and processes applicable to Earth observation systems and services.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of general space law.

RELATED MODULES

To be mastered

3.1

To go further

3.2, 3.4, 3.5

Connected with

1.14 to 1.16

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

• International scale

- UN principles relating to remote sensing of the Earth from Outer Space and their legal value
- Freedom of investigation in Outer Space
- Sovereignty of all States over their own wealth and natural resources
- Legitimate rights and interests of the sensed State
- Access to collected data

• National scale

- Overview of main space powers' EO policies
- National regulations including licensing procedures and maximum resolution authorized in the frame of commercial activities

• International trade

- Export conditions to satellite-based EO systems trade with a specific focus on ITAR

COURSE DIRECTOR

- Mr. Philippe ACHILLEAS, Professor of Space & Telecom Law, University Paris-Saclay



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

MODULE 3.4: ORBITAL RESOURCES REGULATION & MANAGEMENT

OBJECTIVE

- The objective of this course is to provide a general overview of ITU regulations as well as national legislations and procedures to respect in order to access orbital and spectrum resources.
- Upon completion of this course, trainees will have a global understanding of rules to comply with and procedures to follow to access the necessary frequencies.

PREREQUISITES

- In order to take full advantage of this course, trainees should have some knowledge of general space law.

RELATED MODULES

To be mastered

1.9, 3.1

To go further

3.2

Connected with

1.9 to 1.13

TYPICAL DURATION & FORMAT

- 2 to 3 days (16-24 hours)
- Face-to-face or online delivery

TOPICS COVERED

- **Frequency coordination: international rules**
 - Regulations environment
 - Main satellite allocations
 - Filings procedures, ITU space software & BR IFIC
- **Concept of Operations (CONOPs), planning and principle of frequency coordination**
 - CONOPS : General strategy for planning
 - Identification and criticality of interfering networks
 - General concepts of coordination strategy
- **Link budget & C/I**
 - Transmitter, receiver, transmission losses
 - Intermodulation, interference
 - Uplink and downlink budgets closure
 - C/I calculations
 - Tutorial tools & exercises

COURSE DIRECTOR

- Mr. Yann LE DU, Technical Advisor, Satconsult



TOPIC 3: SPACE LEGAL, REGULATORY & SPECTRUM MANAGEMENT

MODULE 3.5: ORBITAL DEBRIS REGULATION & MANAGEMENT

OBJECTIVE

- The objective of this course is to outline the various specific regulatory possibilities to reduce and mitigate orbital debris.
- Upon completion of this course, trainees will have learned how the emission and mitigation of space debris are regulated at the international and national level, and which aspects must be considered when designing their projects.

PREREQUISITES

- In order to take full advantage of this course, trainees should have either some knowledge of technical aspects related to space debris mitigation or of general space law.

RELATED MODULES

To be mastered

3.1

To go further

3.2 to 3.4

Connected with

1.7, 1.8

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **International scale**
 - Regulation through Outer Space Treaties
 - Non-binding measures developed through various international bodies with a focus on IADC guidelines
- **National scale**
 - Brief presentation of national SST/SSA capabilities (e.g. U.S. Space Catalog)
 - Main SSA/SST national policies and their implementation
 - Legally-binding national measures
 - Identification of national best practices
- **Prospection**
 - Potential evolution of the orbital debris regulation
 - Potential impact of this evolution on the market

COURSE DIRECTOR

- Mr. Philippe ACHILLEAS, Professor of Space & Telecom Law, University Paris-Saclay



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

TRAINING MODULES LIST

- 4.1 Introduction to the global space industry & markets
- 4.2 Government space policies, governance & financing
- 4.3 Satellite manufacturing market & players
- 4.4 Space launch service market & players
- 4.5 Ground segment market & players
- 4.6 Satellite communications services market
- 4.7 Satellite Earth observation services market
- 4.8 Satellite navigation services market
- 4.9 “New space” markets & players



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.1: INTRODUCTION TO THE GLOBAL SPACE INDUSTRY & MARKETS

OBJECTIVE

- The objective of this course is to present the structure and organization of space activities worldwide and the changes in progress in the whole ecosystem, both in the uses of space and in terms of market players.
- Upon completion of this course, trainees will have a better understanding of where their organization is situated in the global space ecosystem.

PREREQUISITES

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

RELATED MODULES

To be mastered

To go further

Connected with

1.1, 1.2

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **The four dimensions of space activities**
 - Satellite services on Earth
 - Space science & exploration
 - Man in space
 - Access to space
- **Overview of the satellite value chain**
 - From satellite systems to satellite services and end-users
- **Changes in the space sector**
 - Disruptive trends along the value chain
 - Impact of “new space” changes on the ecosystem
- **Government and private investors in space activities**
 - Established and newcomer space countries
 - Established and newcomer private satellite operators
- **Space industry to manufacture and launch satellite systems**
 - GEO satellites
 - Small satellites and cubesats
 - Constellations

COURSE DIRECTOR

- Ms. Rachel VILLAIN, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.2: GOVERNMENT SPACE POLICIES, GOVERNANCE & FINANCING

OBJECTIVE

- The objective of this course is to present the structuring role and high importance of government for space activities worldwide in terms of civilian and military expenditures.
- Upon completion of this course, trainees will have a better understanding of the key government investors in space and of their rationale for space development.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

Connected with

3.1

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Governments investing in space activities**
 - To develop domestic technology base and industry
 - To procure operational satellite systems and services
- **Governance models of space activities**
 - Established space countries
 - Newcomer space countries
- **Budgets & programs by domain**
 - Space science & exploration
 - Space transportation
 - Human spaceflight
 - Satellite applications: communications, navigation, Earth observation, meteorology
 - Specific military applications: ELINT, IMINT, SSA

COURSE DIRECTOR

- Mr. Simon SEMINARI, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.3: SATELLITE MANUFACTURING MARKET & PLAYERS

OBJECTIVE

- The objective of this course is to present the various markets and key players in satellite manufacturing, whatever the satellite application, mass, size, orbit, etc. may be.
- Upon completion of this course, trainees will have learned the structure and organization of the satellite manufacturing industry, as well as its key players with their distinctive offerings.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

2.4

Connected with

n/a

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Structure of the satellite manufacturing industry**
 - By company: large aerospace contractors, pure players, vertically-integrated satellite operators (satop)
 - By client: government agencies and/or commercial satop
 - By product: satellite platforms, payloads and ground systems
- **Technology roadmap per type of satellite systems**
 - Geostationary communications satellites
 - Small satellite constellations for communications & Earth observation
 - Cubesats/nanosats for technology demonstration and for operational missions
- **Key players by country type**
 - Established space country
 - Emerging space country

COURSE DIRECTOR

- Ms. Rachel VILLAIN, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.4: SPACE LAUNCH SERVICE MARKET & PLAYERS

OBJECTIVE

- The objective of this course is to present the various markets and key players in space transportation, whatever the orbital destination of the spacecraft may be.
- Upon completion of this course, trainees will have learned the structure and organization of the space launch market, as well as its key players with their distinctive offerings.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

1.6, 1.7

Connected with

n/a

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Structure of the space launch service industry**
 - Government-backed launch service providers
 - Privately-owned launch service companies
 - Dedicated and multi-vehicle spaceports
- **Technology roadmap per type of launch systems**
 - Heavy lift launchers
 - Medium lift launchers
 - Small launchers
- **Key success factors for launch services**
 - Anchor client
 - Launch rate
 - System's reusability
 - Spaceport

COURSE DIRECTOR

- Mr. Maxime PUTEAUX, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.5: GROUND SEGMENT MARKET & PLAYERS

OBJECTIVE

- The objective of this course is to present the various markets and key players in the ground segment of a satellite system, either to communicate with a satellite and/or to receive the data from Earth, atmospheric and scientific observation.
- Upon completion of this course, trainees will have learned the structure and organization of the ground segment market, as well as its key players.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

1.8

Connected with

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Structure of the ground segment market**
 - Value chain in the satellite ground station market
 - Gateways for satellite communication networks
 - User terminals for satellite communication networks
 - Satellite data reception stations
- **Technology roadmap for ground stations**
 - High Throughput Satellites & broadband constellations
 - Traditional Cassegrain vs. flat electronic antennas
 - Satellite operation as a service, network digitization
- **Key players for global ground segment services**
 - Incumbent and new pure players
 - Cloud service providers
 - Vertically-integrated companies

COURSE DIRECTOR

- Ms. Rachel VILLAIN, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.6: SATELLITE COMMUNICATIONS SERVICES MARKET

OBJECTIVE

- The objective of this course is to describe qualitatively and quantitatively the various markets for satellite communications (satcom) services and their growth dynamics.
- Upon completion of this course, trainees will have learned the structure and dynamics of key market verticals for satcom services.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

1.9 to 1.12

Connected with

3.2

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Overview of the satcom services market**
 - Value chain from bandwidth to managed services
 - Market players: GEO operators, constellations, service providers, end users' terminals
 - Competition and complementarity with terrestrial networks
 - Changes in satcom services: price, capacity, market access
 - Regional focus on satcom systems & service providers
- **Market dynamics by vertical**
 - Backhauling & trunking
 - Consumer broadband access
 - Enterprise & government private networks
 - Mobile connectivity (in-flight, maritime)
 - TV broadcasting

COURSE DIRECTOR

- Mr. Xavier LANSEL, Senior Consultant, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.7: SATELLITE EARTH OBSERVATION SERVICES MARKET

OBJECTIVE

- The objective of this course is to describe qualitatively and quantitatively the various markets for satellite-based Earth observation (EO) data and value-added services (VAS).
- Upon completion of this course, trainees will have learned the structure and dynamics of key market verticals for satellite Earth observation.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

1.14 to 1.16

Connected with

3.3

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Overview of the EO services market**
 - Value chain: from satellite systems to data & VAS
 - Data producers: government & privately-owned companies
 - VAS providers
 - Regional focus on EO satellite systems and services
- **EO data and VAS market by vertical**
 - Satellite sensors and applications by vertical
- **Market dynamics by vertical**
 - Defence & maritime
 - Agriculture, natural resources & environment
 - Infrastructure & energy
 - Disaster management, insurance & finance

COURSE DIRECTOR

- Mr. Alexis CONTE, Senior Consultant, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.8: SATELLITE NAVIGATION SERVICES MARKET

OBJECTIVE

- The objective of this course is to describe qualitatively and quantitatively the various commercial markets for satellite navigation (satnav) services permitted by the global navigation satellite systems (GNSS).
- Upon completion of this course, trainees will have learned the structure and dynamics of key market verticals for satellite navigation.

PREREQUISITES

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

RELATED MODULES

To be mastered

4.1

To go further

Connected with

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Value chain for satnav services**
 - Government-funded global systems (U.S., Russia, China, and Europe)
 - Regional augmentation systems (India, Japan, ...)
 - Installed base of GNSS devices
 - VAS by vertical
- **Value added services by satnav verticals**
 - Consumer solutions (location-based services)
 - Transportation (road)
 - Other verticals (agriculture, geomatics, ...)
- **Key changes in satnav services**
 - Alternative technologies
 - In-space applications

COURSE DIRECTOR

- Ms. Rachel VILLAIN, Principal Advisor, Euroconsult



TOPIC 4: SPACE INDUSTRY & MARKET DYNAMICS

MODULE 4.9: “NEW SPACE” MARKETS & PLAYERS

OBJECTIVE

- The objective of this course is to describe the emerging markets for new space activities and new applications and/or the new players that compete/cooperate with established players.
- Upon completion of this course, trainees will have learned the key markets and players of the new space economy.

PREREQUISITES

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

RELATED MODULES

To be mastered

To go further

Connected with

TYPICAL DURATION & FORMAT

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

TOPICS COVERED

- **Business logic of new space markets**
 - Startup fundraising
 - Value propositions
 - Time to market
 - Existing customers or Blue Ocean Strategy
 - Creative destruction
- **Key players of the new space economy**
 - Venture capital
 - Small satellites and small launch vehicles
 - COTS satellite electronics
 - New technologies
 - Government as a customer

COURSE DIRECTOR

- Mr. Maxime PUTEAUX, Principal Advisor, Euroconsult



CONTENTS

- Our Training Service Offer In A Nutshell
- Our Training Service Offer Detailed
- Contact Information
- Euroconsult Group Presentation



CONTACT INFORMATION

YOUR CONTACT POINT

Mr. Pierre VALENTI
Senior Affiliate
Euroconsult



CONTACT DETAILS

✉ training@euroconsult-ec.com

☎ +33 6 27 69 73 82 (mobile)

CAREER ABSTRACT

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.



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LEADING INDEPENDENT GROUP

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

Euroconsult Group



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



FOUR COMPLEMENTARY ACTIVITIES



**TAILORED
CONSULTING
SERVICES**



**THEMATIC
TRAINING**



**THEMATIC
RESEARCH
PRODUCTS**



**EXECUTIVE
SUMMITS**

- 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.



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

Euroconsult



EXPERTISE

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.

Euroconsult

Corporate strategy

Strategic assessments

Government programs & policies

Market assessment

Due diligence

Training

Feasibility studies

RFI/RFP process

Satellite & ground segment construction monitoring

Program management & operations support

Sateconsult
Member of Euroconsult Group



OUR CLIENTS

600 clients in 50 countries – 5 global locations



Government



Financial institutions



Service providers



Satellite operators



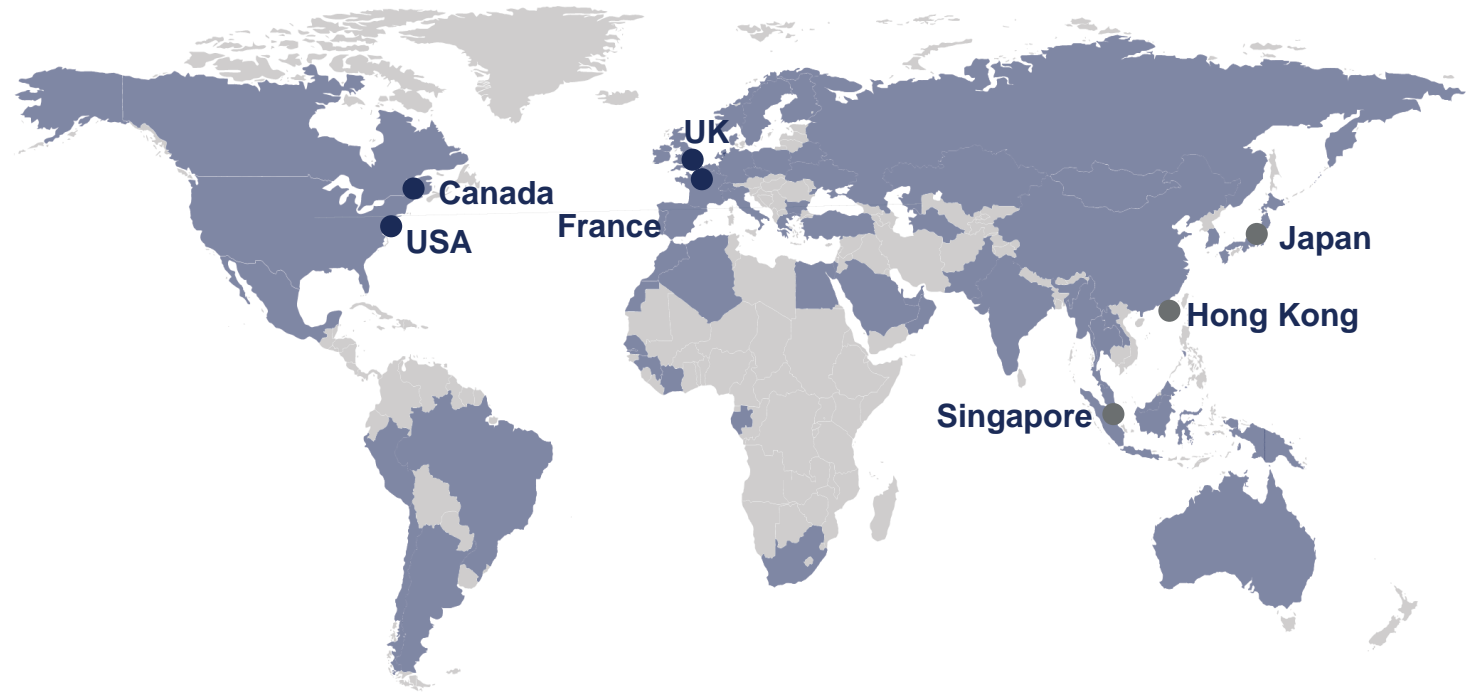
End-users



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



Experienced
& international
management team

Nathan de Ruiten
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



Laurent Valignon
VP Business Development, Satconsult

Part of SATC Executive team since 2008
20 years of experience in the space sector

