



Satellite Systems and Space Industry Course: Orbits, Payloads, Ground Segment and Business Case



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Introduction:

Satellite systems and space industry fundamentals, from orbits and payloads to the ground segment and business case, are covered in this 5-day course for engineers, analysts, managers and policy staff entering the space sector, ending in a Satellite Service Concept and Business Case. Organisations entering the sector often approve missions and service plans without a shared grasp of orbit choice, spacecraft cost drivers, spectrum filings and debris rules. Nominees already hold technical, commercial or policy roles and learn through case studies on mission and market data. CoreConcept Training Center delivers this satellite systems course.

Course Objectives:

- Map the upstream and downstream space economy value chain and position the organisation's role within it
- Compare LEO, MEO and GEO orbits and constellation designs for the coverage, latency and cost of a planned service
- Explain how satellite bus subsystems, payloads, launch and the ground segment fit together in one mission architecture
- Interpret satellite communications link budgets, Earth observation products and navigation services when assessing service proposals
- Assess spectrum and orbital slot coordination, debris mitigation duties and lifecycle cost drivers for a satellite project
- Produce a Satellite Service Concept and Business Case for a case mission

Target Audience:

- Engineering staff responsible for interfaces with spacecraft, ground stations or satellite service platforms
 - Business and market analysts responsible for assessing space sector opportunities and service demand
 - Project and product staff responsible for planning satellite missions or satellite-enabled services
 - Policy, licensing and regulatory affairs staff responsible for spectrum, debris and space activity matters
 - Procurement and finance staff responsible for evaluating satellite, launch and ground segment contracts
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Course Outline:

Day 1: Space Economy, Value Chain and Orbital Foundations

- Upstream and Downstream Space Economy Value Chain Mapping
- Satellite Operator, Manufacturer and Launch Provider Role Map
- Orbital Altitude, Inclination and Period Basics Using Ground Tracks
- LEO, MEO and GEO Orbit Comparison by Latency and Coverage
- Walker Delta and Walker Star Constellation Geometry Overview

Day 2: Spacecraft Architecture, Launch and Ground Segment

- Satellite Bus Subsystems From Power to Attitude Control
- Communications, Imaging and Navigation Payload Types Compared
- Launch Vehicle Selection, Rideshare and Orbit Insertion Steps
- Ground Segment Architecture With TT&C Stations and Mission Control
- Inter-Satellite Links and Ground Network Data Routing

Day 3: Satellite Services and Mission Operations

- Satellite Communications Frequency Bands and Transponder Basics
- Link Budget Basics With EIRP, Path Loss and Margin
- Earth Observation Data Products and Downstream Value-Added Services
- Satellite Navigation Signals, Positioning Services and Timing Uses
- Mission Operations Routines for Telemetry Monitoring and Anomaly Handling

Day 4: Spectrum, Space Debris, Project Lifecycle and Costs

- ITU Radio Regulations Filings and Orbital Slot Coordination Principles
- UN COPUOS Debris Mitigation Guidelines, Graveyard Orbits and Kessler Syndrome
- Satellite Project Lifecycle Phases From Concept Study to Disposal
- Mission Cost Drivers, Launch Insurance and Schedule Risk Register
- New Space Business Models Including Data-as-a-Service and Hosted Payloads

Day 5: Case Study on a Satellite Service Concept and Business Case

- Case Mission Brief Review of Market Need and Users
 - Orbit, Constellation and Payload Choice for the Case Service
 - Ground Segment and Spectrum Coordination Plan for the Case Mission
 - Revenue Model and Cost Estimate for the Case Service
 - Satellite Service Concept and Business Case Completion and Panel Review
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Skills You Will Gain:

- Space Value Chain Analysis
- Orbit and Constellation Selection
- Spacecraft Architecture Literacy
- Ground Segment Planning
- Satellite Service Assessment
- Spectrum Coordination Awareness
- Space Debris Risk Awareness
- Satellite Business Case Development

Why Attend This Course:

- Deliver a Satellite Service Concept and Business Case to the strategy lead and investment committee of the sponsoring unit
- Decide which orbit, constellation size and ground segment model suits a planned service before contracts are signed
- Avoid late spectrum filings, underestimated launch and insurance costs and disposal plans that fail debris rules
- Brief engineering, commercial and policy colleagues with a shared space sector glossary and value chain map

Conclusion:

Back at work, the participant gives the Satellite Service Concept and Business Case to the strategy lead, the investment committee and the engineering team assessing a new mission or partnership. They use it to decide whether to build a spacecraft, buy capacity or partner, which orbit and ground model to pursue and which spectrum and disposal duties must be planned early. After its first use, the unit should review which cost, demand and schedule assumptions held and update the case before the next funding gate.

Frequently Asked Questions FAQ:

What should participants know before the satellite systems and space industry course?

No space engineering background is needed. Participants should be able to read basic technical diagrams and simple financial tables, and may bring a mission, service or partnership idea from their own organisation to use in the case work.

How does the satellite systems and space industry course differ from a VSAT or remote sensing course?

It covers the whole sector at concept level, from the space economy, orbits and spacecraft to spectrum, debris and business models. VSAT and remote sensing courses train operators of one terminal type or one imagery workflow in hands-on depth.

Why does orbit choice matter in satellite systems and the space industry?

Orbit choice sets coverage, latency, satellite count and cost. A GEO satellite covers a wide area from one slot with longer delay, while LEO constellations give low latency but need many satellites, more launches and more ground stations.

What do participants take back from the satellite systems and space industry course?

Participants take back a Satellite Service Concept and Business Case for a case mission, an orbit and payload comparison sheet, a value chain map and a checklist of spectrum, debris and lifecycle cost questions for future projects.
