

# Introduction to Satellite Communications

## *On-line, interactive training course*

### **Satcom Essentials: Your Information Toolkit**

From broadcasting to telecoms and from broadband to narrowband, satellite services and systems are being deployed worldwide at an unprecedented level. GVF is pleased to announce the latest addition to our Satcom Training Academy – an interactive online *Introduction to Satellite Communications Course*.

### **Course Objectives**

This GVF course is designed for professionals who need a comprehensive overview of the key subject areas relating to the delivery of satellite communications today. Included in the Course curriculum are industry history, launch systems, orbits, frequencies, network topologies, equipment types, bandwidth factors, applications, markets, regulations, industry horizontal and vertical structure, major players by segment, hybrids, and much more. Upon completion, trainees will be equipped with a solid understanding of how the satcom market is structured and the capabilities of the technology that makes it all possible.

### **Interactive, animated, on-line delivery**

Students learn at their own pace using animated, interactive on-line content. Simulation-based animations bring topics to life and engage the student. SatProf on-line courses for GVF have been rated as even more effective than instructor-led classroom sessions.



### **Who Should Take This Course?**

The Introduction to Satellite Communications course is intended to provide a thorough overview to everyone who would benefit from a broad knowledge of industry fundamentals, including sales executives, marketing managers, business leaders, and technical, engineering, operations, quality, and customer service staff.

### ***The GVF Training Program***

GVF currently provides a broad range of course content – delivered both online and in classrooms – addressing the information requirements of professionals involved with many aspects of satellite communications: VSAT installers, managers, executives, users, government officials ... anyone anywhere in the world who seeks to strengthen his or her grasp of satellite communications will benefit from one or more of GVF's courses.

## Course outline

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**Getting started.** Using the learning system. Quizzes, exams, and certificates.

**Introduction.** History of satellite communications. The first satellite. How many satellites are there now? Today's satellite market. The Global VSAT Forum. What will we learn in this course? Terms you should know.

**Applications.** Direct-To-Home (DTH) Television. Broadcast program distribution. Internet backhaul. Voice and data trunking. Mobile base station backhaul. Enterprise VSAT. Consumer broadband. Rural telephony. Satellite radio (DARS). Mobile satellite services (MSS). Mobile VSAT services. Transportable VSATs. Energy (oil and gas). Navigation. Tracking. Military. E-government. Other VSAT applications. Disaster preparedness. Earth observation.

**Wireless concepts.** How wireless links work. Repeaters and base stations. Antennas are important. Coverage area.

**Orbits and launches.** Gravity controls orbits. Ballistics experimenter. Orbit experimenter. Satellites in orbit (animated). Satellites viewed from the ground (animated). The great LEO vs. GEO debate. GEO satellite positions. Orbit slots. Co-location. Launch vehicles. Getting to orbit. Multiple payloads.

**Spacecraft technology.** What is a satellite? How big is a satellite? What a satellite needs to function. Payloads. Transponders. Stationkeeping and lifetime.

**Satellite links.** Link budgets and why they control the business model. What dish size is necessary? Spot beams. EIRP and G/T. Footprints and spot beams. Contours. Polarization. Pol frequency re-use. Circular polarization. Frequency bands. Rain fading and availability.

**Network technologies.** Direct broadcast television. Program distribution. Point-to-point links. Star VSAT networks. Time Division Multiplexing (TDM). Time Division Multiple Access (TDMA). Mesh networks. One hop or two? Interoperability. Hybrid networks. Satellite radio (SDARS). GPS - how it works. LEO satellites for mobile service. GEO satellites for mobile service.

**Ground equipment for GEO satcom.** Antennas for VSATs and large earth stations. RF electronics. Modems. VSAT electronics. Interoperability issues. Large antennas. High-power RF amplifiers. Up-down-converters. LNBS and LNAs. Modems. VSAT antennas. Receive only antennas. IRDs. VSAT indoor units. Video encoders.

**Satellite Industry Structure.** Market chains for the VSAT market. Market chains for the DTH market. Market chains for the GMPCS market.

**Horizontal markets.** Launch industry: major players in the industry; launch costs; insurance; launch market size; future trends. The spacecraft industry: satellite costs, major industry players, market size and trends. Satellite operators: the major global, regional, and DTH GEO satellite operators; satellite radio (DARS) operators; mobile satellite service operators. Service providers and integrators. Ground equipment market segments, sizes, and trends.

**Regulatory issues.** How is satcom regulated? Frequency bands and regions. Slot allocation and coordination. Open skies. Earth station licenses. License fees. Regulated performance specifications. Type approvals and homologation. CE marking. Satellite operator verification and type approvals. Band sharing with fixed communications. Band sharing with mobile communications. Network licenses and restrictions. Local regulations. Radiation safety regulations.

**Comparing satellite.** Wired communications. Wireless communications. Speed and population density. Comparing economics. What about fiber? Undersea fiber routes. Population density. Myth or truth?

***A quiz after each lesson reinforces student knowledge. The course ends with a comprehensive final exam. A GVF certificate of completion is provided to each successful student. All students receive a complete set of course notes in PDF format.***

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**Global VSAT Forum**  
The association of the  
global VSAT industry.  
[www.gvf.org](http://www.gvf.org)

For further information, fees, schedules,  
and to register for this and all GVF  
courses, visit the GVF Training Portal at  
[www.gvf.org/training](http://www.gvf.org/training)

Or contact us at  
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