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| **DAY ONE: WEDNESDAY 26 MARCH** |
| 1. Introduction:
	* What is satellite communications?
	* Types of satellite:
		+ Communications, broadcasting, government, and military, weather, scientific, earth observation.
	* History of satellite communications.
	* Terms and acronyms explained.
	* Sources of information.
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| 1. What is a Satellite?
	* Spacecraft descriptions:
		+ Bus and payload.
		+ Stabilisation:
			- Three axis / spin stabilised
	* Payload description:
		+ Transponders.
	* Software-Defined Satellites.
	* Antennas:
		+ Fixed, steerable, phased array, unfurlable (umbrella and frame), digital beam forming and scanning spot beams.
	* Footprints:
		+ Global, regional, spot beams.
	* Inter-Satellite Links:
		+ Radio and optical.
	* Missions:
		+ Fixed services, mobile, TV broadcasting, audio broadcasting and DARS, multimedia satellites, navigation, GPS, low data rate messaging.
	* Satellite Control:
		+ Telemetry and tracking / telecommand.
		+ Attitude control.
		+ Station-keeping.
		+ Satellite lifetime / fuel.
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| 1. Basic orbital mechanics:
	* How do satellites stay in orbit?
2. Launch / transfer orbit / GSO insertion:
	* Geostationary (GSO):
		+ Inclined orbit operation.
	* Non-geostationary Orbits:
		+ LEO, MEO, elliptical, polar.
	* Space Debris.
	* Radiation belts.
3. NGSO and GSO:
	* Typical orbits.
	* Satellite lifetime.
	* Latency.
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| 1. Satellite Launches:
	* Reusable / expendable launchers.
	* Chemical vs electric orbit raising.
	* Launch sites.
	* Launch cost trends.
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| 1. Earth Stations:
	* + Fixed satellite services.
		+ Gateway earth stations.
	* Mobile services:
		+ Luggable, briefcase size and handheld
	* Earth station antennas:
		+ Typical sizes, geometry, applications, cost.
	* Specialised applications:
		+ Maritime and aeronautical
	* Subsystems and components:
		+ RF and baseband description.
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| 1. The Techie Bits:
	* The link budget:
		+ EIRP and G/T, bandwidth, beamwidth, propagation, fade countermeasures, analogue and digital transmission, footprints, frequency bands, link margins, modulation schemes (PSK/QAM), multiple access schemes, (TDMA, FDMA, DAMA), error correction.
		+ Higher order modulation schemes.
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| 1. Spacecraft manufacturers:
	* Old Space:
		+ Boeing / Airbus / Lockheed Martin / Maxar / MDA / Thales Alenia Space / NSIL / CGWIC.
	* New Space:
		+ Astranis / SwissTo12 / Saturn / others.
2. Ground Segment:
	* Gateway earth stations.
	* VSATs.
	* Mobile earth stations (ESIMs).
3. Service providers:
	* Teleports and Services:
	* VSAT Operators.
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| 1. Satellite Finance (Nick Flitterman, Portland Advisers)
	* How to fund satellite projects:
		+ Characteristics needed to attract investment and lenders.
		+ Types of funding available.
		+ Sources of funding, depending on business proposition, region, funding need.
	* What to expect in a fundraising process:
		+ Preparation.
		+ Due diligence process.
		+ Negotiation.
	* Documentation.
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| **DAY TWO: THURSDAY 27 MARCH** |
| 1. Applications:
	* Video broadcasting.
	* Mobile satellite services:
		+ Maritime.
		+ Aeronautical.
	* Internet access.
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| 1. Satellite Operators:
	* Global.
	* Regional.
	* National.
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| 1. Regulatory / Orbits and Frequencies (Christian Keogh, DLA Piper):
	* International Telecommunications Union.
	* Regional and national regulators.
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| 1. Space Junk and Sustainability (Andrew Faiola, Astroscale)
	* Space Situational Awareness (SSA).
	* Active Debris Removal (ADR).
	* End-of-Life Services.
	* In-Orbit Servicing.
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| 1. Legal and Regulatory (Christian Keogh, DLA Piper):
	* "Market access" - service regulation and frequency regulation.
	* Space licensing.
	* Space sustainability.
	* Export controls, security issues.
	* Safety and radiation hazards.
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| 1. New Developments:
	* NGSO:
	* Direct to Device:
	* More to Come?
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| 1. Introduction to space risk management and insurance (Adam Sturmer, Marsh Space Projects):
	* The satellite and space insurance market overview.
	* Failure scenarios:
	* Launch, transfer orbit, in-orbit.
	* Historical failure rates for launch and in-orbit cover.
	* Recent trends and the future.
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| 1. My Life as a Satellite CEO (GE Satellites and AsiaSat): Andrew Jordan (Sonema).
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