SpaceSUITE

Small Satellites and Satellite Communications Systems

An Introductory Online Course

15 and 22 January 2025, Online

About the course:

This online course explores the emerging world of small satellites and satellite communication technologies. Designed for engineering students, space enthusiasts, and professionals in the aerospace industry, this introductory two-session course offers an in-depth look into the rapidly evolving field of small satellites and their communication systems.

Participants:

Whether you're a student, researcher, or industry professional, this course offers an opportunity to get introduced or gain advanced knowledge in small satellite systems and their communication technologies.

Key highlights:

- Comprehensive coverage of small satellite technologies
- Theoretical and practical insights
- Real-world CubeSat mission case studies
- Insights into emerging satellite communication techniques

Timeline:

- 15 January 2025 (16:00-18:30 CET) - **Introduction to Small Satellites and Communication Fundamentals**
- 22 January 2025 (16:00-18:00 CET) - **Advanced Satellite Communications and Emerging Technologies**

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Course Structure:

Session 1: Introduction to Small Satellites and Communication Fundamentals

- The diverse applications of Small Satellites, with a special focus on CubeSats
- Earth Observation, Navigation, and Communication applications
- Detailed exploration of Telemetry, Tracking and Command (TTC) Systems
- Revision of antenna parameters and radio propagation
- In-depth examination of link budget equations
- Signal-to-noise ratio and bit error rate calculations
- Practical examples of ground station satellite tracking, frequency coordination etc.

Session 2: Advanced Satellite Communications and Emerging Technologies

- Practical implementation of an S-band Satellite Communications System for the UAE's AlainSat-1 mission, developed in collaboration with IEEE
- A review of the state-of-the art on Inter-Satellite Links (ISLs)
- Exploration of advantages and limitations in satellite networking technologies

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