



KiboCUBE Academy Season 2: Live Sessions Questions & Answers

Date/Session	Question	Answer
4 Nov 1-1 CubeSat Technologies	When building a CubeSat from scratch, 1) How long does it take to develop a concept? 2) How do you select your components (especially electronic components so that they can withstand radiation and ionization effects)? 3) Are the materials/components to build a CubeSat easily obtainable?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=3810
	What is the difference between the Command and Data Handling System (C&DH) and OBC (on-board computer)?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=4089
	How do you configure the power budget? What are the suggested margins?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=4145
	What is the general life span of a CubeSat?	The life span of a CubeSat is mainly affected by the orbit lifetime, meaning that how long the CubeSat can stay in orbit before it re-enters the Earth atmosphere. If the initial orbit altitude is about 400km, the orbit lifetime can vary from about a year to several years depending on the solar activity, which influences the density of the atmosphere, and hence the atmospheric drag acting on the CubeSat.
	What is the minimum rate for a beacon to transmit and for how long?	A CubeSat is not necessarily equipped with beacon transmitters. And there is no clear definition of the rate and duration of beacon signals. Each satellite developer shall conduct communication link budget design to define the specification of the beacon communication. Please also refer following On-demand Pre-Recorded Lecture of KiboCUBE Academy Season 2:



		Lecture #9 Subsystem Lecture for CubeSat: Communication System (https://www.unoosa.org/oosa/en/our-work/access2space4all/SatDevTrack_Webinars.html#Tag1)
	Do CubeSats have a safe mode and redundancies?	It is common that a CubeSat is designed in the way that it has several different operational modes, such as safe mode, communication mode, observation mode, experiment mode, etc. The safe mode can be regarded as a stand-by mode as well. These are up to project definitions. Implementation of redundancies in any level is depending on the project decision. Due to the limitation of the satellite resources, such as mass, envelop, power, etc., it is often very difficult to implement redundancies in CubeSats.
	Will computers on-board CubeSats need security systems such as anti-virus or some other form of Cybersecurity?	It is not common that a CubeSat or even a general satellite is equipped with anti-virus software.
	How large was the solar sail for the 1U CubeSat "FREEDOM" developed by Tohoku University?	The sail was 1.5 m x 1.5 m large. More on FREEDOM: - Orbit Verification Results of the De-Orbit Mechanism Demonstration CubeSat FREEDOM - Structural Design of De-orbit Mechanism Demonstration CubeSat FREEDOM
	What is the estimated budget for making a functional 1U CubeSat?	It is very difficult to answer this question. It can range from several 10K USD to several 100K USD depending on the satellite mission, components being used, testing facilities used, cost of human resources etc.
4 Nov 1-2 System Integration of CubeSats	How do we decide which mission constraints are more important than the other, if all of them cannot be fulfilled?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=8086
	What is your recommended Computer Network Architecture?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=8136
	Is there specific observation camera used for each specific design of CubeSat or it's just standard for all CubeSats?	There is no standard observation camera system for CubeSats. Terrestrial-use cameras can often be used in space after appropriate



		environmental testing, such as vibration test, thermal vacuum test, etc.
	Why is hub configuration for power Distribution more efficient in bigger systems?	Go to YouTube: https://youtu.be/poNbktVGd7o?t=6025 Electrical power distribution can be more efficient if the supply voltage is higher.
18 Nov 2-1 Launch and Operation of CubeSats	Can a CubeSat be launched into deep space?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=1673
	Can CubeSats be launched above 400km?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=1692
	What is the average mission life-time of a CubeSat launched from the ISS?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=1791
	Are there any active active debris removal (ADR) missions right now?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=1877
	What is the specific cost of developing a CubeSat?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=1918
	What is the maximum mission life-time of a 6U or larger CubeSat?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=2025
	Given that the CubeSats launched from the Kibo module stays in a similar orbit from the ISS, can this pose a threat of a collision with other satellites or the ISS itself?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=2150
	If a CubeSat's orbit is about the same as the ISS, how likely is it to recover them by, for example, robotic arms on the ISS to then be re-purposed for possible subsequent missions?	CubeSats are required to be designed in the way that the altitude decays faster than that of the ISS. Also, spacecrafts which intentionally approaches the ISS requires specific safety designs. Therefore, it is not realistic that a CubeSat can be re-captured by the ISS.
18 Nov 2-2 CubeSat Operations	Which software do you use for Link budget analysis?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=5730
	Is the software deployed on-board is open source? Can it be customized as per the mission objectives?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=5780
	Is it possible that we can upload commands at any point of time using intra communication between 2 satellites?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=5850
	Will the South Atlantic Anomaly (SAA) evolving radiation environments causing the Single Event Effects (SEE) / defects in	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=5946



	the future hinder satellites missions on LEO and GEO in the SAA region?	
	How many ground stations does a country need to have optical communiation with the satellite?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=6089
	What are the guidelines or condicions for a clean room?	Go to YouTube: https://youtu.be/qeSIWP1NFp4?t=6378
2 Dec 3-1 Introduction of CubeSat Projects “BIRDS”	Which frequency band do you use for this BIRDS Global Ground Station Network?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3070
	What physical/simulation flat-sat or test bed do you recommend?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3120
	For the first 1-3 CubeSats as tech demonstrators/prototypes, would you recommend a shared ride or deploying from the ISS?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3186
	Among the BIRDS1 results; Why was there no uplink success at that time? How did you operate those satellites without uplink?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3363
	Some satellites failed to uplink and downlink implying failure of the mission. How can we convince decision makers to provide budget again after such failure?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3408
	How do you join the BIRDS project?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=3500
2 Dec 3-2 Online Tour of CubeSat Environmental Test Facility	Is the antenna tracking software self-developed or was it bought in a single package with the hardware equipment?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=5047
	Which level is the clean room that is used?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=5179
	How did you reach the conclusion to do shield only for the battery and not the rest of the components of the nanosatellite?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=5283
	For the BIRDS project, may COTS components of the participant country be used?	Go to YouTube: https://youtu.be/OYbtmhNocig?t=5374