# Capstones:

The CubeSat Project was with undergraduate students working together and cooperating with industry experts in order to build a complete CubeSat.

All together during the first year, 2018-2019 school term, there was:

* 1 undergraduate thesis project
* 10 engineering capstone teams
* 5 academic programs involved: EE, CE, MME, MSE and SE.
* In total 40 undergraduate students over the term
* 4 graduate students acting as advisors and collaborating with the students.

The capstone teams looked into two separate design: UHF and S band both coined opportunity and spirit for our inner team purposes. The reason being that UHF and S band have different data rates we can communicate with earth at, as well as different power restrictions which is critical without a wall outlet in space!

Some of the capstone teams had some photos and documentation of their process throughout the year or of their final products.

## The subsystems that can be seen in the folders are:

1. Attitude determination and control: determining where in orbit the CubeSat is, and controls where the CubeSat is pointing.
2. Communications UHF (opportunity): The team which determined how much information could be sent from the CubeSat to a ground station on Earth.
3. Grounstation tracking: The team which built the control mechanism to point and find the CubeSat in space at times when it is flying overhead.
4. Structural Opportunity: The team which build the surrounding structure for the Opportunity CubeSat design. They have some cool photos including thermal photograph testing and a model for the CubeSat.

## What events did they get to participate in?

1. Mission Concept Review: A review done by the Canadian Space Agency where they took a look at the initial designs and gave feedback to the students. We encouraged students to come present their information themselves, a couple of capstones groups did take advantage of the industry networking opportunity.
2. Neptec/MDA Tour: The capstone students were invited to visit Neptec (Owned by MDA), and industry company which helped the students with some of their testing (thermal imaging) for their capstone projects. They also show a tour of their facilities as well.
3. Space Day: A chance for students to present at Western some of the work they did on their capstones. Industry representatives, members of CPSX (now Western Space) and other university faculty members were present at this event.

## Other Information:

* TradeOff\_Poster: A poster that outlines some general information about the work done by the capstone teams. A good outline of the Trade-off study between UHF and S band (opportunity and spirit) designs is shown!
* WhatIsCubeSat\_Poster: A poster that does a good job outlining what our mission is, what is a CubeSat in general and some of the basic information which might be CRITICICAL for a banner!
* GroupPhoto\_Christmas.png: A photo of part of the team that we tried to assemble before Christmas. It is difficult to get 40 people into one room but we got a fair chunk of our team present!
* Ukpik1-CubeSat-information-slide.pdf: A one pager that is also used to describe the current CubeSat mission.
* CubeSat\_Prototype.jpg: Is a prototype model that the students built with various placeholders for parts that would be more expensive. This was part of the structural teams’ prototypes.