For our drone design, a few considerations must be made in regards to the frame that we design. The overall mass must be considered, due to the additional load that the rotors incur when producing thrust. To properly fit with other modules, the mass of the frame must be constrained to a reasonable ratio, and all modules must fall under the maximum thrust to mass ratio. This is the most important consideration to make when building the frame.

The overall dimensions should also be considered, such that stability is offered when regulating the rotor speeds as part of the control system, but that unnecessary space is not taken. If the rotors are too close to one another, small changes in rotor speed may result in destabilization. The overall size of the design should be large enough to encapsulate all parts, and provide stability. It should be no more large, to avoid adding mass to the system.

Strength is another consideration to make. It's expected during the prototyping phase, and during erroneous flight, that the drone may crash land. As a result, the frame could be damaged. There are several methods we can employ to reduce the damage. By having separate modules for the frame, replacement is made much easier when damage does occur. The type of material should also be considered. As we have 3D Printing as an option, PLA will be used in the first instance due to its ease of printing. ABS would be a better option as it is less brittle, and also less dense than PLA.

The overall structure of the drone should be built to fit certain specifications. A mesh type design can be used to remove the unnecessary mass from the drone, without reducing strength between joints. Connection points must be offered to prevent any of the electronics coming loose, due to the forces of acceleration and gravity experienced by the drone. A dual layer body can be used to encapsulate the electronics in the centre of the frame. Rotor cages should be used to avoid potential injury. And the battery must be taken into special consideration in its positioning, as lithium polymer batteries are flammable when subject to sudden damage.