**Honeywell – Case study tasks (draft)**

1. **Case study: Remote controlled parachute design study**

There has been an incident in the port of a remote island and the citizens are trapped there already for 2 days. Even though the food and water supplies are sufficient for long time, there is high demand for special medication for some of them. You have 6 hours to design a device, that can be attached to the chest of medical supplies. The chest then will be dropped by a transporting aircraft and it should have the capability to land within 20 meters radius of the target point.

**Usage:** Parachute dropping and servo control laws that should be used in the design are big areas in aerospace operations (Logistics and flight controls)

 **What problem we want them to solve:**
 The students will be challenged to concept design from scratch a controllable parachute, a complicated, trending electromechanical problem with lots of future applications in Aerospace and Defense market. In details they will need:
 **What are the “mechanical” aspects of the task (how can FME students help to solve the problem):** Design the body of the device. Describe the flight mechanics for their device. Estimate the recommended structure. (materials, weight limitations, control surfaces, stretching limitations etc)

**What are the “electrotechnical” aspects of the task (how can FEEC students help to solve the problem):**
Design the sensors, flight controls and navigation system of the vehicle.

**Outcome**
Defend your device in a 15-20 minutes presentation.
 **The participants will be evaluated by a committee against the following:**1) Critical Evaluation of the problem (10%)
2) Originality of the proposed solution (10%)
3) Feasibility of the proposed solution (10%)
4) Mechanical design (bullet 4 above) (30%)

5) Electrical design (bullet 5 above) (30%)
6) Presentation skills and impressions (10%)

Parachute dropping and servo control laws that should be used in the design are big areas in aerospace operations (Logistics and flight controls)
 **2) Case study: Vertical Take Off and Landing (VTOL) aircraft for urban mobility concept.**

Your task is to create a vehicle able to fly between skyscrapers’ rooftops (1hour or more autonomy) , in the most efficient and safe way possible.

**Usage**: This topic is extremely hot in Honeywell currently. Any innovative input – idea regarding it can make the difference in this “race” we have on UAM against competitors.

**What problem we want them to solve:**

The students will be challenged to concept design from scratch a VOTL, a complicated, trending electromechanical problem with lots of future applications in Aerospace market. In details they will need:

**What are the “mechanical” aspects of the task (how can FME students help to solve the problem):**

Design the body of the vehicle. Describe the flight mechanics for their vehicle. Estimate the recommended structure of their vehicle. (materials, weight limitations, control surfaces, stretching limitations etc)

**What are the “electrotechnical” aspects of the task (how can FEEC students help to solve the problem):**
Design the power capacitors, power distribution and flight controls of the vehicle.

**Outcome**

Design proposal and feasibility study of that design. Deliver a 15-20 minutes presentation describing the functionality of the vehicle.

**The participants will be evaluated by a committee against the following:**
1) Critical Evaluation of the problem (10%)
2) Originality of the proposed solution (10%)
3) Feasibility of the proposed solution (10%)
4) Mechanical design (bullet 4 above) (30%)

5) Electrical design (bullet 5 above) (30%)
6) Presentation skills and impressions (10%)