



## CASE STUDY

### Title

**Space Missions Currently in Development/Operation Research Activity – University College London**

### Summary

University College London have run a curricular 2-week research project into space missions that are currently in development/operation for their MSc Space Science and Engineering students. The students work in pairs and are required to submit a 2500-word report within 2 weeks of the task being set.

### Aims/Objectives

The research activity is intended to fuel the interest of the students in space by giving them the opportunity to conduct in-depth research into a specific mission that is in development or in operation. The activity aims to improve teamworking skills, report writing skills and general research skills.

### What was the context / background?

At UCL, the Masters' programme divides into two streams: 'Space Technology and Satellite Communications' and 'Space Science'. Both streams conduct this research activity within the first couple of months of the course. This activity serves as a good opportunity to have the technologist working in pairs with the space scientist so that they may both learn from the two different perspectives.

### How was it organised and who was involved?

This is a staff-led curricular activity. The activity takes place over a 2-week period within the first 2 months of the MSc Space Science and Engineering course. The annual process to organise this activity is as follows:

- Provide students with briefing document which sets out the guidelines of the activity.
- Pair the students up with a partner that they have not worked with previously.
- Allow students to do the research in their own time.
- One student per group uploads their finished document to submission point.
- Reports are marked.
- Students provided with feedback.

## What resources did you need?

The students were provided with paper copies of the briefing document which are required to be printed beforehand.

Depending on the size of the group, support may be required to mark the reports.

## Describe the activity (Max 1000 words)

The UCL research activity breaks down into 5 stages:

1. Student briefing
2. Independent and co-dependent research
3. Report submission
4. Marking
5. Feedback

### 1. Student briefing

- Students are provided the briefing document. The briefing document sets out the following guidelines:
  - Students must have not worked with each other on a previous project.
  - Each space mission chosen by a team must be different.
  - Report must discuss the following:
    - The most innovative, ground-breaking aspects of the mission.
    - The expected scientific discoveries and advance of knowledge it will bring.
    - The technical challenges to be faces and how they will be resolved.
    - Mission relevancy and timeliness.
  - Report length (2500 words not including references, tables and figures).
  - Audience – scientifically informed, but not deeply familiar with the topic – report should not include strings of equations or very complex physics.
  - Report deadline and submission point.
  - Guidance on referencing.
  - Marking criteria.
- Students are paired up and commence their research.

### 2. Independent and co-dependent research

- Students conduct the research in their own time – they must first select their mission and check with their peers that nobody else is looking at the same mission.
- Once the mission is selected they conduct further research into both the scientific objectives of the mission, the technological challenges it faces and how these have been overcome.

### 3. Report submission

- Guidance on report submission is provided in the briefing document.

#### 4. Marking

- The breakdown of marks is as follows:
  - Introduction, problem definition, references: 20 marks max
  - Description of methods and techniques: 30 marks max
  - Discussion of innovation/timeliness/relevance/challenges: 35 marks max
  - Presentation, literary style, organisation: 15 marks max
  - Total out of 100 marks.

#### 5. Feedback

- Students provided with feedback to incorporate into their next reports.
- Conducting this activity so early in the year allows for report writing standards to be established early to improve the quality of submissions later in the year.

## Key Learning Points

- Referencing and bibliography was found to be below the required standard for many students when the activity was first run, so further guidance was given in the briefing document for subsequent years.
- Language issues were found to be an issue for some overseas students coming to undertake the Masters. Given how early in the year this work was set, the submitted report served as a useful tool to be able to direct some of these students to the relevant avenues of support required to improve their English.

## Thematic Categories (tick any that apply to your case study)

Method		Topic	
Online Text and Notes	<input type="checkbox"/>	Orbits and Trajectories	<input type="checkbox"/>
Assessment Materials	<input type="checkbox"/>	Rocket Propulsion	<input type="checkbox"/>
Video and Audio Lectures	<input type="checkbox"/>	AOCS/ADCS	<input type="checkbox"/>
Lecture Slides	<input type="checkbox"/>	Payloads	<input type="checkbox"/>
Curricula	<input type="checkbox"/>	Power	<input type="checkbox"/>
Video and Audio Clips	<input type="checkbox"/>	Communications	<input type="checkbox"/>
Recommended textbooks	<input type="checkbox"/>	On Board Data Handling	<input type="checkbox"/>
Useful software	<input type="checkbox"/>	Systems	<input type="checkbox"/>

Worksheets and Projects	<input type="checkbox"/>	Mechanical	<input type="checkbox"/>
Simulations	<input type="checkbox"/>	Thermal	<input type="checkbox"/>
Tutors' Guides	<input type="checkbox"/>	Astronomy	<input type="checkbox"/>
	<input type="checkbox"/>	Earth Observation	<input type="checkbox"/>
	<input type="checkbox"/>	History of Spaceflight	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	Other	<input checked="" type="checkbox"/>

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