

# Research & Professional Ethics

2024

Lecture 1

Kelvin Martins

# Introduction and Orientation

# Topics Covered

- Overview and basic concepts;
- Proposing a research and setting research objectives;
- Ethical issues and considerations of academic integrity;
- The different types of research methods;
- Reviewing the literature and writing critically;
- Writing the different sections of a thesis;
- Producing a coherent, visually attractive thesis.

# The Module

In this module, you will get guidance on:

- How to frame and propose a research project;
- How to write a research proposal and thesis with all sections;
- How to write critically and cite relevant sources;
- How to use a variety of research methods;
- Ethics and integrity.

However, this needs to come from you:

- Your topic;
- Your objectives;
- Your methods;
- Your sources;
- Your ideas.



Your project is yours.  
You are the expert!

# The Module

Very important:

This module cannot offer you guidance on choosing a topic, or explore technical questions.

# The Lectures

- **12 lectures**, attendance is mandatory
  - Every Friday @ 15:00 GMT
  - 15-20 min break
  - Recording and slides will be on Moodle
- ✓ Presentations
  - ✓ Debates
  - ✓ Videos
  - ✓ Activities
  - ✓ Case Studies

# Assessment

Method	Weight	Issued	Due
<b>CA1:</b> Research Basics	20%	Week 2	Week 4
<b>CA2:</b> Research Proposal	80%	Week 6/7	Week 13

About me





Background in Industrial Engineering



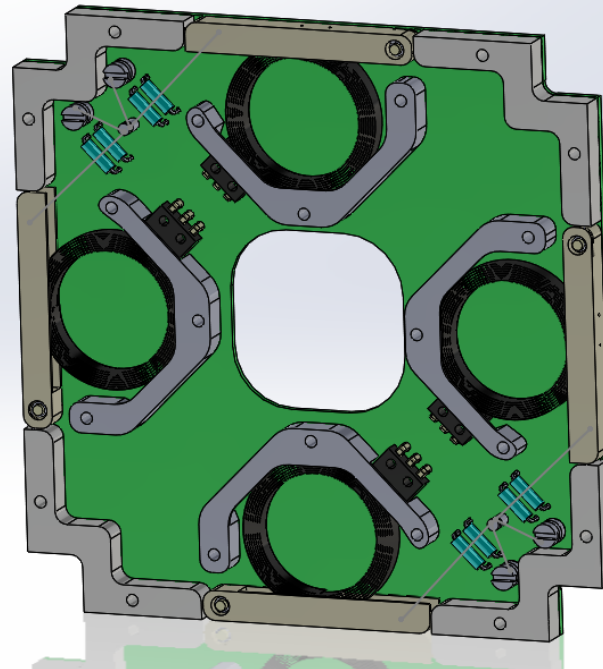
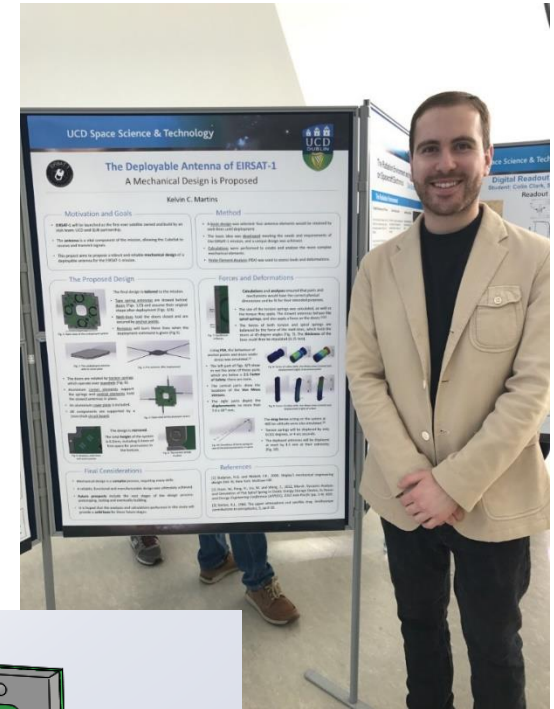
Masters in Space Science and Technology



Current PhD on Educational Theories for Training on Sustainable Technologies

- My Master's Thesis:

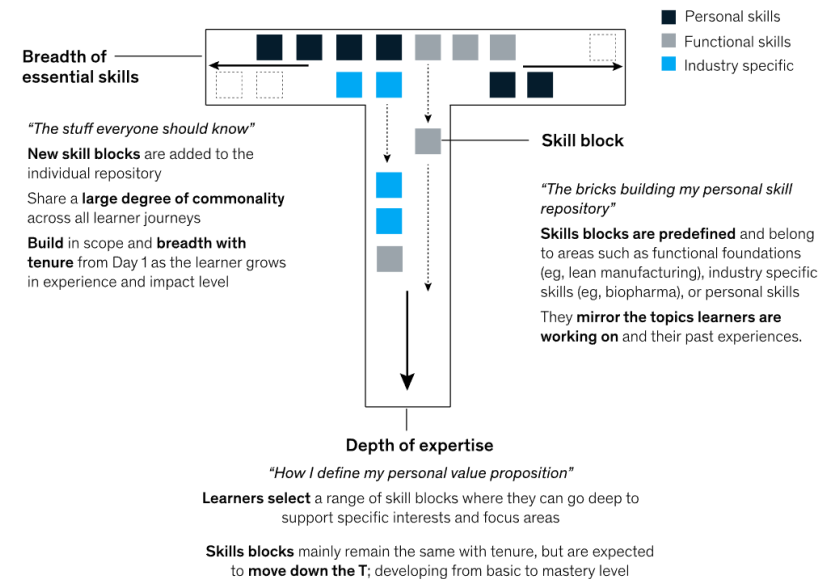
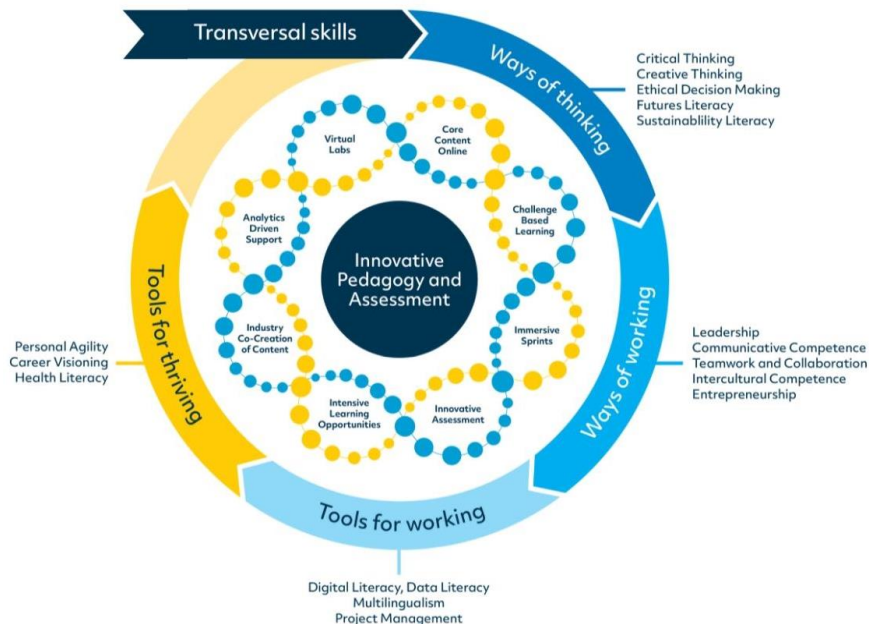
## The Proposed Mechanical Design of a Deployable Antenna for the EIRSAT-1 CubeSat



- My PhD Thesis:



## Developing a Holistic Approach to Training and Upskilling on Emerging Sustainable Technologies





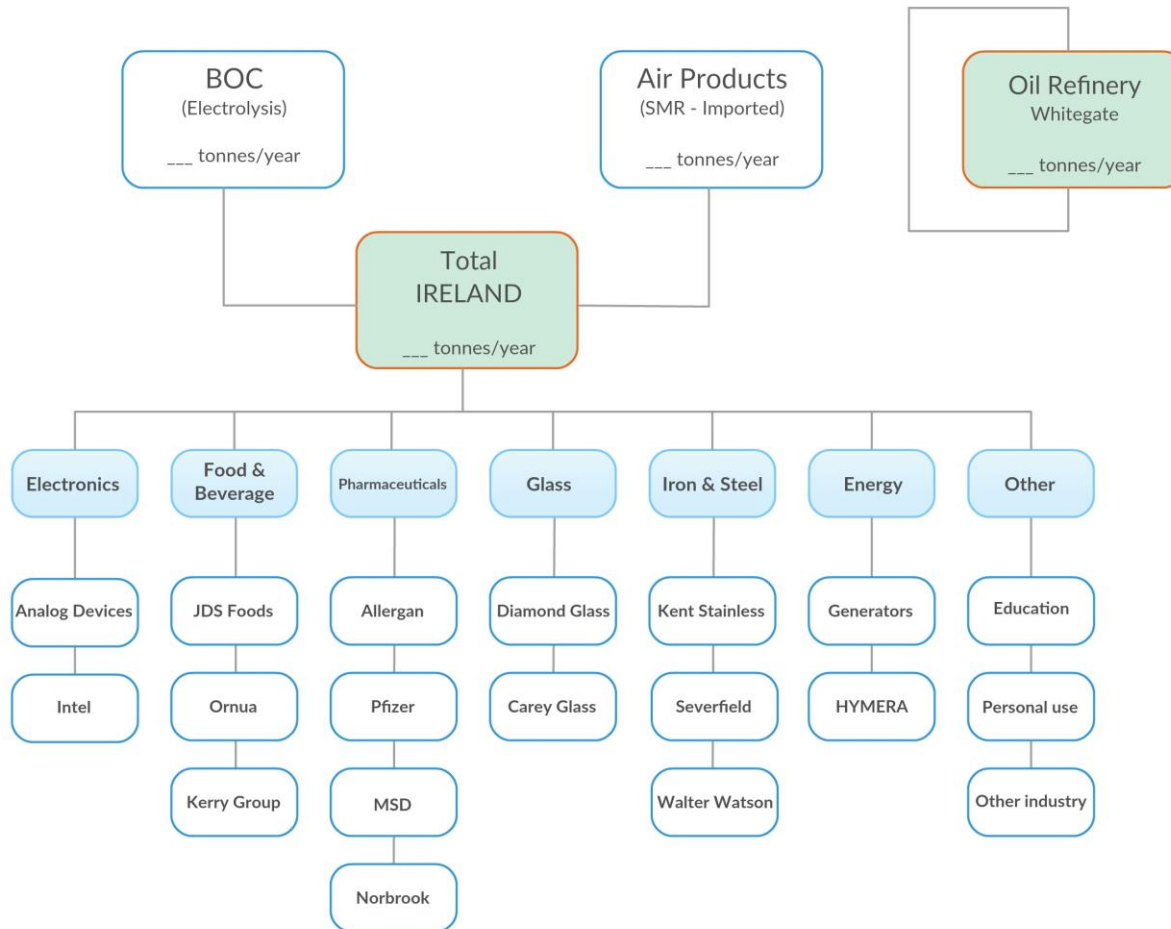
- Other Research Projects:  
**Creative Engine**  
DCU



- Other Research Projects:

## Hydrogen in Ireland

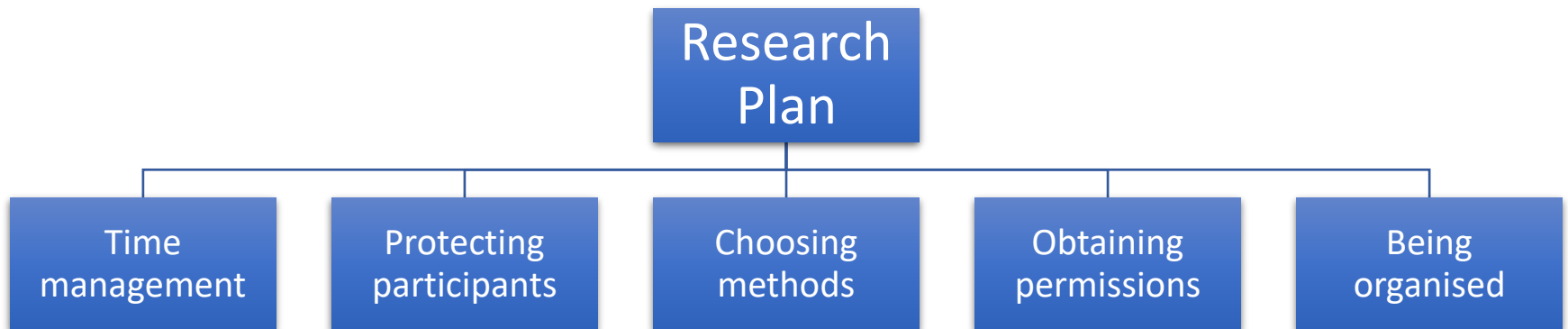
### DCU



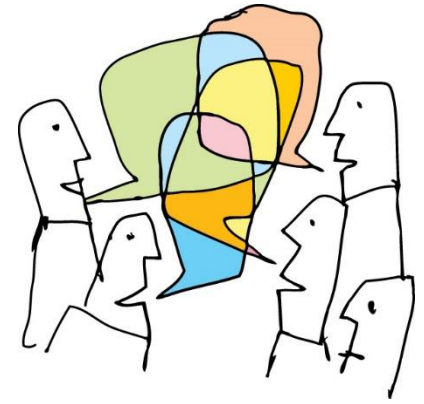
# Research & Professional Ethics

# Research & Professional Ethics

- The main objective of this module is to provide guidance and resources in terms of the research aspects of your final project.
- It will also reinforce the importance of conducting your research following ethical guidelines and ensuring academic integrity.



## Class Activity



What are the main elements  
of a research paper?



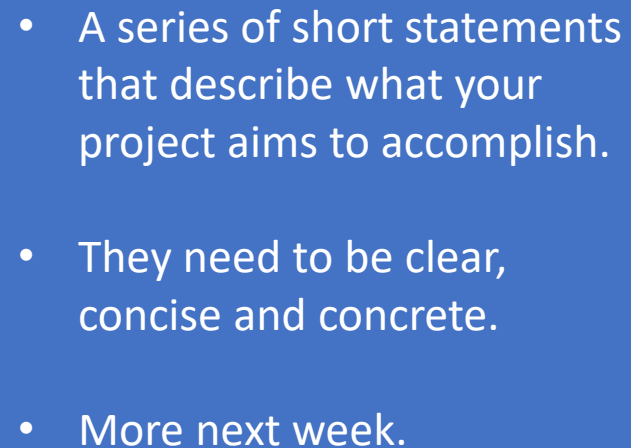
# Research & Professional Ethics

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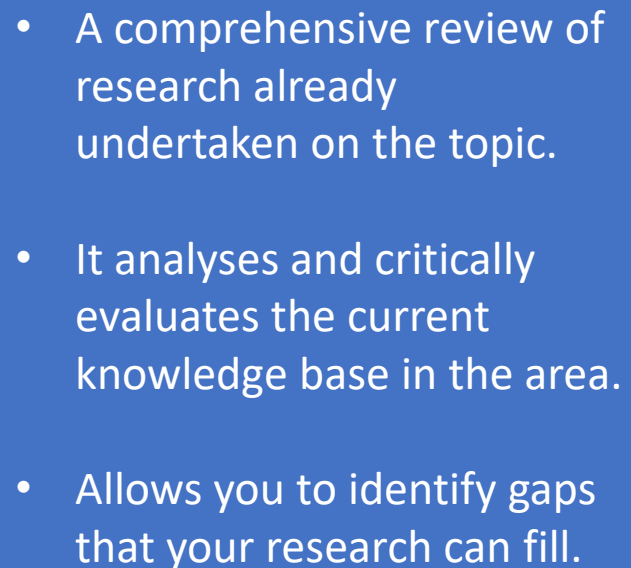
- Your research objectives

- 
- A series of short statements that describe what your project aims to accomplish.
  - They need to be clear, concise and concrete.
  - More next week.

# Research & Professional Ethics

- By the end of the semester, you are expected to have written and submitted a **full research proposal**, containing:

- Your research objectives
- Your literature review

- 
- A comprehensive review of research already undertaken on the topic.
  - It analyses and critically evaluates the current knowledge base in the area.
  - Allows you to identify gaps that your research can fill.

# Research & Professional Ethics

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- Your research objectives

- Your literature review

- Your methodology

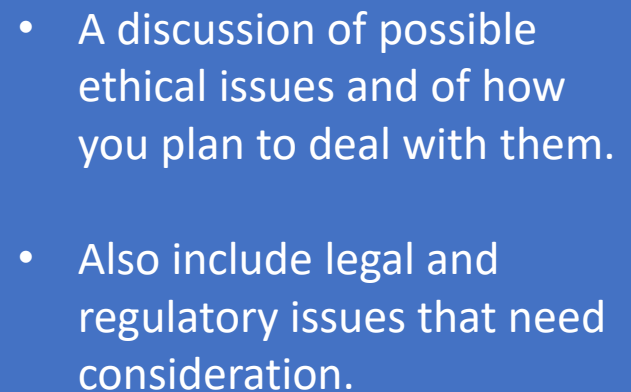
- The methods that you plan to use in your research.

- They include techniques, procedures, and tools that will help you identify the challenge and arrive at an answer.

# Research & Professional Ethics

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- Your research objectives
- Your literature review
- Your methodology
- Your ethical considerations

- 
- A discussion of possible ethical issues and of how you plan to deal with them.
  - Also include legal and regulatory issues that need consideration.

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- Your research objectives
- Your literature review
- Your methodology
- Your ethical considerations

	<p>We will explore each topic in detail, plus other sections of a research thesis such as:</p> <ul style="list-style-type: none"><li>• The abstract</li><li>• The introduction</li><li>• The findings</li><li>• The discussion</li><li>• The recommendations</li><li>• The conclusion</li></ul>

# Some Essential Concepts

# Primary vs Secondary Research

## Primary Research

- Original data is collected by you;
- A variety of methods is available;
- Usually takes longer, but results are more specific.

## Secondary Research

- Original data was collected by someone else;
- Usually involves analysing existing research;
- Care must be taken so the information used is relevant and up-to-date.



How would you rate the following?

Primary

Secondary

Surveys

Statistical  
analysis

Experiments

Analysis of  
reports

Literature Review

Interviews

On-site  
observations

P P

S S

P P

S S

How would you rate the following?

- A research assistant analyses results of surveys carried out last year for a project.
- An industrial engineer maps the processes of a company in order to suggest improvements.
- A student reads and summarises the main points of a case study for a college essay.
- A researcher performs a case study in a company by observing behavioural change in employees.
- A project manager circulates a questionnaire to a target market and collects responses.

# Quantitative vs Qualitative Data

- As a researcher, you are responsible for knowing where your data comes from and for fully understanding what it is.
- An important way to think about your data is to divide them between:

## Quantitative data

- Can be represented numerically and analysed statistically.

## Qualitative data

- Describes the nature of a subject, usually represented textually or visually.

How would you rate the following?

Quantitative

Qualitative

Test scores

Numerical survey  
responses

Audio recordings

Customer opinions

Sketches

Measurements

Customer ratings

QT QT

QL QL

QT QT

How would you rate the following?

QL QL

- Video recordings of students debating a current issue.
- Records of sea level elevation on a gauge.
- A collection of sculptures by Italian artists.
- Survey results of consumers describing their in-store experiences.
- Survey responses of workers indicating hours worked per week.
- A medical form with average diameters of a patient's arteries.
- Journal entries by pregnant women describing typical symptoms.

Thank you

Questions?