

CRIAQ 2024 Student Challenge

Aerospace industry's contribution to reducing GHG emissions



The student challenge in brief

The CRIAQ 2024 Student Challenge is aimed at Quebec university students and aims to address a growing challenge in the aerospace industry. It is becoming increasingly clear that the industry needs to accelerate its investments to adopt a green and sustainable approach, to the point where there is a consensus on this.

Against this backdrop, CRIAQ is keen to support a student team in carrying out a study to explore ways of integrating this major paradigm shift. The challenge is as follows: **how should players in the aerospace sector adjust their innovation and business strategies to reduce their GHG emissions? The issue must be tackled from different angles: technological, economic, social, environmental and regulatory.**

Proposals will be evaluated by a committee including experts in the field and representatives from CRIAQ.

Teams of two (2) students are invited to submit their applications, including:

1) a preliminary analysis of the issue (*initial key references, understanding of the subject, issues to be addressed in the work to be provided, needs for assistance in setting up the project*).

2) a proposed work plan (*key stages in the methodology used to carry out the work, description of the objectives set by the students, details of the deliverables developed, project planning*).

The winning team will be involved in the project by carrying out an in-depth, paid assignment on the subject at the CRIAQ as soon as possible in spring 2024.

Key dates :

- Opening of the challenge: 19th February, 2024
- Closing date for receipt of proposals: 18th March, 2024
- Selection of five (5) candidates and invitation to present their team and approach to the study: March 19th, 2024
- Flash presentations by the selected teams : Week of 25th March, 2024
- Announcement of the winning team : 1st April, 2024

Description of the 2024 Student Challenge

Note : In this document, the masculine gender is used indiscriminately and solely for the sake of brevity.

Introduction

Since its creation in 2002, the mission of the *Consortium de recherche et d'innovation en aérospatiale au Québec*, or CRIAQ, has been to increase the competitiveness of the aerospace industry by stimulating business innovation through collaborative R&D and by actively participating in the training of the next generation through concrete projects. The hundred or so projects completed and in progress have all enabled Quebec students to work directly on the aerospace industry's key issues.

In 2023, CRIAQ launched its first Student Challenge on the issue of space debris.

This year, to help build a sustainable vision for the aerospace industry, CRIAQ wants to give students the opportunity to take on the challenges ahead and be the voice of change for tomorrow's aerospace sector.

Theme of the challenge

The growth of the aerospace sector in recent decades has certainly opened up new horizons, but it has also created crucial challenges in terms of sustainable development. Globally, the airline industry is forecasting a threefold increase in air traffic by 2050¹, which, given current resources, would tend to lead to excessive energy consumption and a failure to comply with the limitations imposed on the sector^{2,3}.

As global awareness of the environmental consequences of industrial activities intensifies, the aerospace sector seems to be embarking on an expansion of its activities that could be perceived by the general public as a passive stance in the face of the urgent challenges linked to sustainability and carbon neutrality. A concrete example of this dynamic can be seen in the latest report on the state of the aerospace industry in Canada⁴, which is rather discreet with regard to these crucial issues.

As one of the leading regions in the global aeronautics industry, Quebec has a role to play in raising awareness of the ecosystem. The CRIAQ is mobilising the various players involved in projects for the future of Quebec, and would like to encourage a student team to work on this issue.

Here are some examples of potential areas of work for the challenge (non-exhaustive and by way of illustration):

- How can all stakeholders agree on "measurable" and "traceable" objectives that can contribute to the successful development of sustainable solutions in aeronautics?
- 2050 is the most common vision, so why not imagine the use of aeronautics by 2100? This should take into account the role of Canada, governments and industry in international negotiations and commitments.
- For companies such as SMEs and start-ups, how can they be helped to gain better visibility of their impacts and understand the areas for improvement and innovation?

Why participate ?

CRIAQ's 2024 Student Challenge is an opportunity for students to contribute to a very real aerospace industry issue.

The winning team will have the opportunity to work on a paid assignment at CRIAQ starting in the summer of 2024. The objective of this assignment will be to carry out an in-depth study on the subject in accordance with the work plan proposed in their application file.

¹ Stay grounded (2023) – Fiches greenwashing aviation
[factsheet-offsets-FR.pdf \(stay-grounded.org\)](#)

² OACI Environnement – Climate change.
[Climate Change \(icao.int\)](#)

³ OACI Environnement – Trends in Emissions that affect Climate Change
[Trends in Emissions that affect Climate Change \(icao.int\)](#)

⁴ AIAC (2023) – State of Canada's Aerospace Industry Report
[State of Canada Aerospace report2023 0.pdf](#)

The selected students will meet with various experts in the field to learn more about the realities of the industry, refine their understanding of the issue and test potential avenues. At the end of the mission, CRIAQ will publish the results of the study to promote the importance of this issue within the industry and to stimulate the emergence of new ideas and solutions. This is a great opportunity for students to develop their careers.

To whom is the challenge for?

- Quebec university students at all levels (bachelor's, master's, doctorate, postdoctorate);
- Graduates of Quebec university who graduated less than a year ago;
- Teams must consist of two (2) people

How to submit a proposal?

Students are invited to form teams of 2 to prepare their application, which should take the form of a proposal to CRIAQ.

If students have difficulty finding a teammate, we invite them to fill the following form: [CRIAQ - Student Challenge: 2024 \(office.com\)](#). This form will enable us to match you with another candidate interested in taking part.

The purpose of the application is to provide a clear summary of the participants' understanding of the challenge and to propose a concrete work plan that can be carried out over a 13-week period and that they will be able to carry out themselves.

Challenge participants will be invited to be creative in their application, but as a minimum their proposal must conform to the following structure:

PART 1 - Team profile

- Academic profile;
- Interest in the subject and the aerospace industry;
- Relevant experience, multidisciplinary, etc.

PART 2 - Summary of the problem

- Brief overview of the problematic;
- Underlying issues: technical, social, environmental, economic, regulatory.

PART 3 - Methodology and proposed approach

- Methodology and tools;
- Preliminary work plan;
- Timeline.

Since the best applications will be invited to make a short "flash" presentation to CRIAQ, it is recommended to prepare your application in the form of a presentation (PowerPoint, Google Slides, Canvas, etc.). You are asked to limit your proposal to 15 pages, in a reasonable font size (between 12 and 18 pts) and appropriate for this type of presentation.

The application must then be sent to CRIAQ in PDF format at the following address: etienne.gaultier@criaq.aero et benoit.cyrenne@criaq.aero

List of documents to be attached.

- Team's proposal (.PDF)
- Team CV's (.PDF)

Timeline

Date	Item
February 19 th , 2024	Launch of the 2024 Student Challenge
March 18 th , 2024	Application deadline
March 19 th , 2024	Evaluation of files and invitation to submit to CRIAQ
Week of March 25 th , 2024	Presentation of the selected teams and final evaluation
Mid-May, 2024	Beginning of the work placements at CRIAQ for the winning team
End-August, 2024	End of the project and final presentation of the study

Evaluation criteria and weighting of criteria

Critère	Dimensions
Understanding of the theme (35%)	Clarity and completeness in describing issues
	Relevance of the points raised as priorities
Quality of the team (35%)	Experience of students
	Complementary profiles (multi-university, multi-department)
	Maturity of existing connection, collaboration, and exchange links
Methodology and work plan (15%)	Quality of the proposed approach
	Feasibility in the given time frame
	Creativity or novelty in exploring the challenge
Presentation (15%)	Quality of the visual support
	Quality and ease of oral presentation
