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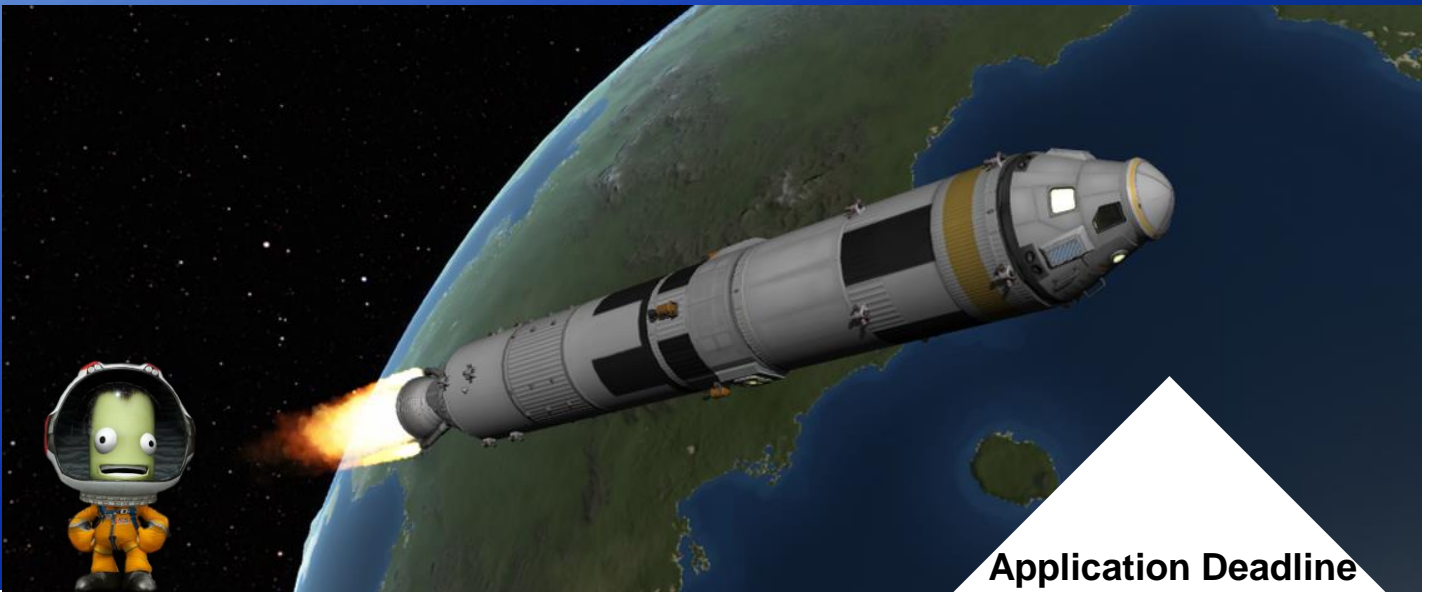
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Aerospace Course (Level IV)

Space Mission (Phase I)

Rocket Science and Orbital Mechanics

10Botics Limited



Application Deadline

~~11 Nov 2022 12:00 noon~~

17 Nov 2022 12:00 noon

Result Release

~~18 Nov 2022~~

22 Nov 2022

Intended Learning Outcomes

Upon completion of the programme, participants should:

1. Achieve a high level understanding of rocket science and apply the knowledge in designing satellites, manned planetary landers, space stations, robotic rovers, etc;
2. Apply orbital mechanics to design spaceflight trajectories to other planets and conduct space rendezvous;
3. Use Kerbal Space Program to simulate upcoming space missions such as deep space mining, in-situ resource utilization and planetary defense



◆ Introduction

The new space race is on! Are you ready for the great adventures?

Join HKAGE and Billy Hau, aerospace enthusiast and former NASA engineer, on an exciting journey to explore the science and technology behind flights!

During the 3-part aerospace engineering programme, students will learn about the fundamental principles of aerodynamics, rocketry, orbital mechanics and robotics through fun and engaging hands-on activities.

In **Phase I**, we will learn how to design spaceships and plan trajectories to explore various target destinations! We start by applying Newton's Third Law of Motion to understand how rocket propulsion works. From there, we will take a look at the components that make up a rocket and attempt to build our own in a spaceflight simulator called Kerbal Space Program. Finally, we will design our own space missions to conquer outer space!

The programme consists of **three phases** and selection for future phase is based on student performance from the previous class. The tentative schedule for Phase 2 and 3 are as below for reference.

Mars Robotic Rover (Phase 2): 11 Feb to 25 Mar 2023

Aircraft Design (Phase 3): 29 Apr to 27 May 2023

◆ Schedule (Phase I)

Session	Date	Time	Venue	Topic
1	3 Dec 2022	9:00am – 1:00pm	HKAGE	Rocket Propulsion & Spacecraft Design
2	10 Dec 2022			Powered Descent & Robotic Rovers
3	17 Dec 2022			Intro to Orbital Mechanics
4	14 Jan 2023			Orbital Maneuvers & Rendezvous
5	28 Jan 2023			Mars Exploration Missions
6	4 Feb 2023			Planetary Defense and the Moon Base





◆ Target Participants

- **S1 - S6** S2—S4-HKAGE student members in 2022/23 school year
- Class size: 30

◆ Medium of Instruction

Cantonese with English handouts

◆ Certificate

E-Certificate will be awarded to participants who have:

- fulfilled **80%** attendance of the programme; AND
- completed **all the assignments** with satisfactory performance

◆ Screening

Please answer the screening question in the online application form.

*The screening question is designed to help the applicant understand the course level and the course content. The question must be answered by the student applicant and it can only be attempted once. The answer cannot be changed once the application is submitted. Selection is based on students' performance in answering the question. Only students who can demonstrate passion, motivation and the knowledge of Aerospace Engineering in the screening question can be enrolled in the programme.

◆ Technical Requirements

The course will make use of 3D software for spacecraft design and spaceflight simulation. Therefore, students are required to bring a laptop to attend the course.

Recommended laptop configuration:

- 8th gen Intel i5 cpu / Apple M1 or above
- 8GB RAM
- 40GB storage space

