



ALGEBRA SERIES:

# VECTORS

(MATS3320)

## Introduction

A series of Algebra programmes offered by the **Department of Mathematics, the University of Hong Kong**, are designated for Maths lovers to learn Algebra progressively.

The **Algebra Series** consists of the following programmes:

Programme	Code	Application	Programme held
Matrices and Determinants	MATS3230	Jul-18	Oct 2018
Vectors	MATS3320	Oct-18	Dec 2018
Matrices and Equations	<a href="#">MATS3240</a>	Jan-19	Mar 2019
Linear Algebra	<a href="#">MATS3250</a>	Apr-19	Jun - Jul 2019

Here comes the second programme in the **Algebra Series**, Vectors.

In physics, a vector is usually described as an object with both magnitude and direction. Indeed, the concept of vectors finds lots of applications in physics. Vectors can also be treated in a more mathematical way, and such treatment forms part of the foundation of linear algebra.

## Programme Type / Level

Geometry and Topology Course (Level 4) ([Token-required](#))

## Instructor(s)

Dr Ching Tak Wing  
Department of Mathematics, the University of Hong Kong

## Pre-requisites

Student should have basic knowledge in Computation of determinants.

## Target Participants

- S1 – S6 HKAGE student members
- Class size: 25



All applicants **MUST** attend the screening test held on **17 Nov 2018** in **HKU** except those who have passed the programme “Matrices and Determinants (MATS3230)”.

Priority will be given to student members who have passed MATS3230 and they could have direct admission to this programme when apply.

## Medium of Instruction



English with English handouts

## Certificate



**E-Certificate** will be awarded to participants who have:

- ❖ Attending **at least 3 sessions** **AND**
- ❖ Satisfactory performance in both assignments and assessments

## Intended Learning Outcomes



Upon completion of the programme, participants should be able to:

1. carry out basic operations on vectors;
2. solve simple problems related to various vector products;
3. apply the concept of vectors in a variety of geometry problems.

## Application Deadline

**12 Nov 2018**

Application Result Release Date **21 Nov 2018**

HKAGE student members may withdraw from the programme on or before the deadline. Otherwise, the token will be deducted.

## Schedule (Tentative)



Session	Date	Time	Venue	Content
	<b>17 Nov 2018</b>	<b>10:00 a.m. – 12:00 n.n.</b>	<b>G05, James Hsiung Lee Science Building HKU</b>	<b>Screening Test</b>
1	1 Dec	9:30 a.m. – 12:30 n.n.	Room 210	Basic Operations on Vectors
2	8 Dec		Run Run Shaw	Dot, Cross and Scalar Triple Products
3	15 Dec		Building	Applications of Vectors to Geometry
4	22 Dec		HKU	Test and Discussions

Remarks: For any assessment to be held in the programme, no make-up will be arranged, including Screening Test.

### MAP

### Sample Examples for the Programme

- Find the image of the vector  $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$  under the rotation by  $30^\circ$  with the origin as the centre.
- Prove the Cauchy-Schwarz inequality for vectors in  $\mathbb{R}^n$ .

### Enquiries



For enquiries, please contact us at 3940 0101 after language selection, press "1".