SISP 1104 Calculus: The First Steps

Course Description
Calculus is an important mathematical subject with fascinating applications in a wide range of disciplines. This course aims at providing a general perspective on Calculus for students interested in mathematics. The fundamental ideas and concepts in Calculus discussed in this course include the following: challenging problems in the historical development of Calculus, concepts of functions and limits, derivatives and the shapes of graphs, areas and integration, anti-derivatives and the Fundamental Theorem of Calculus, and interesting applications of Calculus in problem solving.

Topics
1. Commensurability, Euclidean Algorithm, Continued Fraction
2. Rectangular Approximations of Areas, Definite Integrals
3. Velocity and Displacement
4. Tangent Line Problems, Derivatives
5. Fundamental Theorem of Calculus
6. Rules of Differentiation and Integration
7. Optimization, Rates of Change
8. Derivative Formulas for Exponential Functions
9. Infinite Series for Exponential Functions

Grading Scheme
- Classwork (10%)
- Homework (40%)
- Final examination (50%)

[Topics and grading schemes are subject to change as deemed appropriate. Students will receive information and guidelines in class on how they will be assessed for the course.]

Instructor
Prof Jimmy FUNG
Prof Fung received a BSc and PhD in Mathematics from the University of Durham, UK and from Department of Applied Mathematics & Theoretical Physics, University of Cambridge, UK respectively. He joined HKUST’s Department of Mathematics in 1992. Prof Fung is a frequent winner of the Top Ten Lecturers’ Award and is widely recognized for his passion and effective teaching in and out of the classrooms. In 2013, Prof Fung was conferred the Michael G. Gale Medal for Distinguished Teaching Award, which is the highest award that HKUST gives to a professor for exemplary teaching. Prof Fung has been teaching SISP 1104 for HKUST Summer Institute since 2012. His course has been very well-received by Summer Institute participants.