Academic Org: Fac Office of Engineering – Subject: Courses offered by Fac of Erg

**Course:** ENGG1125　　　　**Course ID:** 014852　　　　**Eff Date:** 2025-07-01　　　**Crse Status: Active**　　　**Apprv. Status:** Approved　　　**[New Course]**

Single Variable Calculus for Engineers 單元微積分及其工程應用

This course is designed for engineering students to acquire mathematical techniques in single-variable Calculus to model and solve engineering application problems. Topics include functions and their limits, continuity, derivatives, differentiation, integration and applications of Calculus to various engineering disciplines.

Students are expected to have mathematics background equivalent to HKDSE with Extended Module I or II.

本科旨在幫助工程系學生獲得單變量微積分的數學技術，以建模和解決工程應用問題。主題包括函數及其極限、連續性、導數、微積分及其在各種工程學科中的應用。

**Grade Descriptor:**　　A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

CU_CURR501
Page 2 of 4

THE CHINESE UNIVERSITY OF HONG KONG
**Print Course Catalog Details**

June 18, 2025
11:27:21 AM

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

**Equivalent Offering:**
**Units:** 3 (Min) / 3 (Max) / 3 (Acad Progress)
**Grading Basis:** Graded
**Repeat for Credit:** N
**Multiple Enroll:** N
**Course Attributes:**

**Topics:**

## COURSE OUTCOMES

**Learning Outcomes:**

Upon successful completion of the course, the students will have acquired the ability to:
1. understand the mathematical principles of single variable Calculus
2. master the techniques of solving single variable Calculus problems
3. use single variable Calculus to model and solve common engineering problems and applications

**Course Syllabus:**

Week 1: Transcendental functions: polynomial, exponential, logarithmic and trigonometric functions and their inverses

CU_CURR501
Page 3 of 4

THE CHINESE UNIVERSITY OF HONG KONG
**Print Course Catalog Details**

June 18, 2025
11:27:21 AM

Week 2: Curves represented by parametric equations

Week 3: Limits, derivatives, continuity, rates of change

Week 4-6: Rules of differentiations of functions, graphs, mean value theorem, implicit differentiation, stationary points, maximum and minimum values, Newton's method, L'Hôpital's rule, differentials, vector valued functions and their differentiation rules.

Week 7: Series (Taylor expansion, Taylor and Maclaurin series, techniques involving power series and Taylor's theorem)

Week 8-10: Integration as a reverse process of differentiation, indefinite integrals, definite integrals, techniques of integration, partial fractions, graphs, integration applications: area under curves, volume of revolution

Week 11-12: Engineering Modelling and Applications, introduction to first-order differential Equations

Week 13: Introduction to multi-variable calculus

**Assessment Type:**

| | |
|---|---|
| Examination | : 50% |
| Homework or assignment | : 15% |
| Participation | : 10% |
| Test or quiz | : 25% |

**Feedback for Evaluation:**

Students may provide their feedback through office hours and course evaluation.

**Required Readings:**

Provided by the course teacher(s) in the respective teaching term.

CU_CURR501
Page 4 of 4

THE CHINESE UNIVERSITY OF HONG KONG
**Print Course Catalog Details**

June 18, 2025
11:27:21 AM

**Recommended Readings:**

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley

2. T. Croft, R. Davison, Mathematics for Engineers, A modern interactive approach, 2nd ed., Prentice Hall

3. C. Edwards, D. Penney, Calculus, Early Transcendentals, Matrix Version, 6th ed., Prentice Hal

## OFFERINGS

1. ENGG1125    Acad Organization=ENO; Acad Career=UG

## COMPONENTS

LEC : Size=80; Final Exam=Y; Contact=3
TUT : Size=80; Final Exam=N; Contact=2

## ENROLMENT REQUIREMENTS

1. ENGG1125    **Enrollment Requirement Group:**
    Not for students who have taken ESTR1007 or MATH1510

    **New Enrollment Requirement(s):**
    Exclusion = ESTR1007 or MATH1510

## Additional Information

VTL-Onsite face-to-face hrs    0
VTL-Online synch. hrs    0
VTL-Online asynch. hrs    0
No. of micro-modules    0
Research components (UG)    0%

**< E N D  O F  R E P O R T >**