

**Math1014-L3 Calculus II**  
**Course Outline - Spring 2025**

**1. Instructor(s)**

Name: Dr. LAM, Tsz Kin

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Office Hours: Thu 4:00pm-6:00pm (in the Math Support Center)

**2. Teaching Assistant(s)**

Name: LEUNG Ka Lun ([klleungat@connect.ust.hk](mailto:klleungat@connect.ust.hk)), XIE Zijun ([zxieam@connect.ust.hk](mailto:zxieam@connect.ust.hk)),

ZHAO Zhenyu([zzhaick@connect.ust.hk](mailto:zzhaick@connect.ust.hk))

**3. Meeting Time and Venue:**

Lecture:

**Date/Time/Venue:**

L3: TuTh 13:30 - 14:50, LTF

Tutorial:

**Date/Time/Venue:**

T03A: Tu 18:00-18:50 LG3009 LEUNG Ka Lun ([klleungat@connect.ust.hk](mailto:klleungat@connect.ust.hk))

T03B: Tu 12:30-13:20, LSK1032, XIE Zijun ([zxieam@connect.ust.hk](mailto:zxieam@connect.ust.hk))

T03C: Mo 9:30-10:20. Rm 4590, ZHAO Zhenyu([zzhaick@connect.ust.hk](mailto:zzhaick@connect.ust.hk))

**4. Course Description**

Credit Points: 3

Pre-requisite: Math1012, or Math1013, or Math1023, or grade A- or above in Math1003

Exclusion: Math1020, Math1024.

Brief Information/synopsis:

This course is a sequel to Math1012 or Math1013. Topics include applications of definite integrals, integration techniques, improper integrals, infinite sequences and infinite series, power series and Taylor series, and vectors.

**5. Intended Learning Outcomes**

On successful completion of this course, students should be able to:

No.	ILOs
1	apply basic integration skills;
2	apply the method of integration on formulating and solving problems;
3	handle basic problems for the convergence of infinite sequences and series;
4	apply various vector operations in dimension 2 and 3.

## 6. Assessment Scheme

- a. Examination duration: final exam 3 hrs
- b. Percentage of coursework, examination, etc.:

<u>Assessment</u>	<u>Assessing Course ILOs</u>
10% by online WeBWork homework ( <a href="https://webwork.math.ust.hk">https://webwork.math.ust.hk</a> )	1, 2, 3, 4
35% by midterm exam	1, 2, 3, 4
55% by final exam	1, 2, 3, 4

- c. The grading is based on criterion-referencing performance on assessment tasks. The grade ranges essentially reflect the following: A (Excellent Performance: High level of conceptual understanding and computation skills), B (Good Performance: good conceptual understanding and computation skills), C (Satisfactory Performance: minimum understanding of the concepts with satisfactory computation skills), D (Marginal Pass: fragmented basic computation skills), F (Fail)
- d. AI Policy: No restriction in using AI for self-studying, but the students should be aware that AI tools in are not permitted in the written exams of the course.
- e. Academic Integrity: Students are expected to adhere to the HKUST academic integrity policy.

## 7. Student Learning Resources

Text/Reference:

J. Stewart, "Calculus–Early Transcendentals". Cengage.

J. Hu, W.-P. Li, Y. Wu, "Calculus for scientists and engineers with matlab".

## 8. Teaching and Learning Activities

Scheduled activities: 4 hrs (lecture + tutorial)

## 9. Course Schedule

Keyword Syllabus:

- Review of definite integrals and the Fundamental Theorem of Calculus.
- Integration by parts, trigonometric integrals, trigonometric substitutions, polar coordinates and calculus, partial fractions.
- Numerical integration
- Improper integrals.
- Area of a region between curves
- Volume by the methods of slicing and cylindrical shells.
- Length of curves, surface area, work, average value of a function.
- Sequences and infinite series, divergence and integral, ratio, root, and comparison tests, alternating series.
- Taylor polynomials, power series and Taylor series.
- Vectors in two and three dimensions, dot products, cross products.