Math1014-L3 Calculus II

Course Outline - Spring 2026

1. Instructor(s)

Name: Dr. LAM, Tsz Kin

Contact Details:

Office: Room 3419 Phone: 2358-7457 Email: tklam@ust.hk

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

2. Teaching Assistant(s)

Name: KUNG Sam (skungkc@ust.hk), LIANG Phyllis (masxliang@ust.hk),

XIE Zijun (zxieam@connect.ust.hk),

3. Meeting Time and Venue:

Lecture:

Date/Time/Venue:

L3: MW 9:00am - 10:20am, LTF

Tutorial:

Date/Time/Venue:

T03A: Mon 17:30-18:20 Rm 2503 Sam KUNG (klleungat@ust.hk)

T03B: Mon 16:30-17:20. Rm 2503, Phyllis LIANG (masxliang@ust.hk)

T03C: Wed 14:00-14:50, Rm 1527, XIE Zijun (zxieam@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.:

Assessment	Assessing Course ILOs
10% by online WeBWork homework (https://webwork.math.ust.hk)	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. However, students should be aware that AI tools are not permitted in the written exams of the course. Using AI tools to do homework without understanding is not helpful at all.

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:

- Riemann sums and definite integrals, 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.