

Math1014-L1 Calculus II
Course Outline - Fall 2025-2026

1 Instructor(s)

Name: Dr. LIU, Stephen Shang Yi

Office: Room 3446 Email: masyliu@ust.hk (also stephen.liu@ust.hk)

Office Hours: TueWed 15:00-17:00 at Room 3446, please email beforehand.

2 Teaching Assistant(s)

WONG, Chun Hei Burton (maburton@ust.hk),

LIANG, Shixin Phyllis (masxliang@ust.hk)

3 Meeting Times and Venue:

Instructor	Lecture/Tutorial Section	Date and Time	Room
LIU Stephen Shang Yi	L1	MonWed 09:00-10:20	LTF
WONG Chun Hei Burton	T1A	Wed 10:30-11:20	1527
LIANG Shixin Phyllis	T1B	Tue 17:00-17:50	1409
LIANG Shixin Phyllis	T1C	Mon 13:30-14:20	4502

4 Course Description

Credit Points: 3

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

Exclusion: AL Pure Mathematics, AL Applied Mathematics, 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	solve convergence problems of infinite sequences and series;
4	apply various vector operations in dimension 2 and 3.

6 Assessment Scheme

- a. Examination duration: Midterm Exam: 1.5 hrs, Final Exam: 3 hrs
- b. Percentage of coursework, examination, etc.:

<u>Assessment</u>	<u>Assessing Course ILOs</u>
10% by Online WeBWork Homework (https://webwork.math.ust.hk)	1, 2, 3, 4
35% by Midterm Exam (Time and Date: To be announced)	1, 2,
55% by final exam	1, 2, 3, 4

- c. The grading is assigned based on performance in assessment tasks. The grade 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 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: 4hrs (lecture + tutorial)

9 Course Schedule*

Chapter sections corresponding to *J. Stewart, “Calculus-Early Transcendentals”*. *Cengage* are shown in parentheses below.

Lecture	Date	Topic
1	Sept. 1	Review of Definite Integrals, The Fundamental Theorem of Calculus, Indefinite Integrals, The Substitution Rule (5.2-5.5)
2	Sept. 3	Area Between Curves (6.1)
3	Sept. 8	Volumes (6.2)
4	Sept. 10	Volumes by Cylindrical Shells (6.3)
5	Sept. 15	Work (6.4)
6	Sept. 17	Average Value of a Function (6.5)
7	Sept. 22	Integration by Parts (7.1)
8	Sept. 24	Trigonometric Integration (7.2)
9	Sept. 29	Trigonometric Substitution (7.3)
	Oct. 1	Public Holiday - National Day
10	Oct. 6	Integration of Rational Functions by Partial Fractions (7.4)
11	Oct. 8	Approximate Integration (7.7)
12	Oct. 13	Improper Integrals (7.8)
13	Oct. 15	Arc Length, Area of a Surface of Revolution (8.1-8.2)
14	Oct. 20	Polar Coordinates and Calculus (10.3-10.4)
15	Oct. 22	Infinite Sequences (11.1)
16	Oct. 27	Infinite Series (11.2)
	Oct. 29	Public Holiday - Chung Yeung Festival
17	Nov. 3	Integral Test, Comparison Tests (11.3-11.4)
18	Nov. 5	Alternating Series (11.5)
19	Nov. 10	Absolute Convergence and the Ratio and Root Tests (11.6)
20	Nov. 12	Power Series, Representations of Functions as Power Series (11.8-11.9)
21	Nov. 17	Taylor and Maclaurin Series (11.10)
22	Nov. 19	Applications of Taylor Polynomials (11.11)
23	Nov. 24	Three Dimensional Coordinate Systems (12.1)
24	Nov. 26	Vectors, Dot Product, Cross Product (12.2-12.4)

Midterm time and Date: To be announced.

*- Subject to revision.

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