Math1014-L1 Calculus II
Course Outline - Fall 2026-2027

1 Instructor(s)

Name: Dr. LIU, Stephen Shang Yi
Office: Room 3446 Email: masyliu@ust.hk (also stephen.liu@ust.hk)
Office Hours: Tues 15:00-17:00 at Room 3446, please email beforehand.

2 Teaching Assistant(s)

TBA (TBA),
TBA (TBA)

3 Meeting Times and Venue:

Instructor	Lecture / Tutorial Section	Date and Time	Room
LIU Stephen Shang Yi	L1	Mon 15:00-16:20 Fri 10:30-11:50	Lecture Theater E
TBA	T1A	Tues 13:30-14:20	Room 1409
TBA	T1B	Fri 12:30-13:20	Room 2304
TBA	T1C	Wed 12:00-12:50	Multi-function Room, LG4, Lib

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	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.:

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

c. The Midterm and Final Exams will be **closed-book** and **calculators will not be allowed**. A formula sheet will be provided for the exams.

d. Only a valid reason along with proper documentation (e.g. medical certificate) will be considered for applying for Makeup Midterm and Final Exams. If a student is approved to take a Makeup Midterm Exam but is not able to attend it with valid reason, the weighting of the Midterm Exam will be shifted to the Final Exam (0% Midterm Exam, 90% Final Exam). If a student is absent without valid reason, then they will receive a score of 0 for that exam (Midterm, Final, any Makeup Exams).

7 AI Policy

AI use is permitted for assignments and for self-studying. The use of AI tools and other unauthorized aid is **strictly prohibited** for the Midterm and Final Exams.

8 Academic Integrity

Students are expected to adhere to the University's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity — HKUST - Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

9 Communication and Feedback

Assessment marks for the Exams will be communicated via the Math Department Grading System in a timely manner. Students who have further questions about the feedback

including marks should consult the instructor within five working days after the feedback is received.

10 Final Grade Descriptors

The assignment of letter grades is **criterion-referenced** according to the grade descriptors below (not graded on a "curve"). The exact "grade boundaries" will vary due to the difficulty of the assessments.

Grades	Short Description	Elaboration on subject grading description
A	Excellent	The student has mastered almost all techniques of basic one-variable calculus taught in the course, and has excellent and thorough conceptual understanding on the subject content.
B	Good	The student has mastered most computational techniques of one-variable calculus taught in the course, yet the understanding of some challenging concepts may not be deep enough.
C	Satisfactory	The student meets the minimum expectation of the instructor, has acquired some basic computational techniques of the subject, but some concepts were not clearly understood.
D	Marginal pass	The student is only able to recall some fragments of topics and is able to complete some of the most elementary computations.
F	Fail	The student does not have sufficient understanding of even some fragments of topics, and is not even able to complete elementary computations.

11 Required Texts and Materials

Text/Reference:
J. Stewart, "Calculus-Early Transcendentals". Cengage.
J. Hu, W.-P. Li, Y. Wu, "Calculus for scientists and engineers with mathlab". (optional).

12 Additional Resources

Math Support Center located at Room 3011-3013.

13 Teaching and Learning Activities

Scheduled activities: 4 hours (3 hours lecture + 1 hour tutorial)

14 Course Schedule*

*- Subject to revision.

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

Lecture	Date	Topic
1	Sept. 4	Review of Definite Integrals, The Fundamental Theorem of Calculus, Indefinite Integrals, The Substitution Rule (5.2-5.5)
2	Sept. 7	Area Between Curves (6.1)
3	Sept. 11	Volumes (6.2)
4	Sept. 14	Volumes by Cylindrical Shells (6.3)
5	Sept. 18	Work (6.4)
6	Sept. 21	Average Value of a Function (6.5); Integration by Parts (7.1)
7	Sept. 25	Integration by Parts (7.1); Trigonometric Integration (7.2)
8	Sept. 28	Trigonometric Integration (7.2); Trigonometric Substitution (7.3)
9	Oct. 2	Trigonometric Substitution (7.3)
10	Oct. 5	Integration of Rational Functions by Partial Fractions (7.4)
11	Oct. 9	Integration of Rational Functions by Partial Fractions (7.4) Approximate Integration (7.7)
12	Oct. 12	Approximate Integration (7.7); Improper Integrals (7.8)
13	Oct. 16	Improper Integrals (7.8); Arc Length, Area of a Surface of Revolution (8.1-8.2)
	Oct. 19	Public Holiday - day following the Chung Yeung Festival: no class
14	Oct. 23	Arc Length, Area of a Surface of Revolution (8.1-8.2); Polar Coordinates and Calculus (10.3-10.4)
	Oct. 24	Midterm Exam
15	Oct. 26	Infinite Sequences (11.1)
16	Oct. 30	Infinite Series (11.2)
17	Nov. 2	Integral Test, Comparison Tests (11.3-11.4)
18	Nov. 6	Alternating Series (11.5)
19	Nov. 9	Absolute Convergence and the Ratio and Root Tests (11.6)
20	Nov. 13	Power Series, Representations of Functions as Power Series (11.8-11.9)
21	Nov. 16	Taylor and Maclaurin Series (11.10)
22	Nov. 20	Applications of Taylor Polynomials (11.11)
23	Nov. 23	Three Dimensional Coordinate Systems (12.1)
24	Nov. 27	Vectors, Dot Product, Cross Product (12.2-12.4)
25	Nov. 30	Vectors, Dot Product, Cross Product (12.2-12.4)

Midterm Time and Date: TBA.