MATH1014 -Calculus II

Course Outline – Spring 2022

1. Instructor(s)

Name: Dr. XIE, Changjian
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2. Teaching Assistant(s)

Name: LIANG, Shixin Phyllis
Office: Math Support Center   *Email:* masxliang@ust.hk

3. Meeting Time and Venue:

<u>*Lecture:*</u>

Date/Time/Venue:

Lectures and tutorials will be delivered via Zoom Meeting until further notification

- Online – Zoom meeting ID to be announced

- Offline (Mixed mode) – L10: Tuesday, Thursday 12:00PM - 01:20PM, Rm 2407, Lift 17-18

<u>*Tutorials:*</u>

Date/Time/Venue:

- T10A: We 11:00AM - 11:50AM, Rm 2407, Lift 17-18 (online zoom meeting ID to be announced)

- T10B: We 09:30AM - 10:20AM, Rm 5583, Lift 29-30 (online zoom meeting ID to be announced)

- T10C: Tu 06:00PM - 06:50PM, Rm 1014, LSK Bldg (online zoom meeting ID to be announced)

4. Course Description

Credit Points: 3
Pre-requisite: Math1012, or Math 1013, or Math 1023, or grade A- or above in Math1003
Exclusion: AL Pure Mathematics, AL Applied Mathematics, Math1003, Math1018, 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 (ILOs)

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

No.	ILOs
1	obtain basic integration skills;
2	apply the techniques 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: final exam 3 hrs;

b.   Percentage of the coursework, examination, etc.:

Assessment	Assessing Course ILOs
10% by online homework Hw1 – Due Feb 20, 11:50pm closed Hw2 – Due Mar 1, 11:50pm closed (More see https://www.classviva.org)	1,2,3,4
35% by midterm exam	1,2,3,4
55% by final exam	1,2,3,4

c.   The grading is assigned based on students' performance in assessment tasks.

7.   Student Learning Resources

Recommended Reading:
Textbook(s):

- J. Hu, W.-P. Li, Y. Wu, "Calculus for scientists and engineers with matlab" (available at https://www.classviva.org);

- Other reference: J. Stewart, "Calculus-Early transcendentals", 8$^{\text{th}}$ ed., Brooks/Cole.

8.   Teaching and Learning Activities

Scheduled activities: 4 hrs (lecture+tutorial)

9. Course Schedule

Keyword Syllabus:

- Review of definite integrals and 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 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.