UFUG1103 (L01) - Calculus II

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Course Basics

Instructor: Grant Rao
Email: **guangrao@hkust-gz.edu.cn**

Time: Mon/Wed 12:00-13:20
Location: E1-149

Office: W4-519
Office Hours: Wed 9:00-11:00 (booking at https://klms.hkust-gz.edu.cn/ (https://klms.hkust-gz.edu.cn/))

GTA:

- Li Yuyan: yli382@connect.hkust-gz.edu.cn (mailto:yli382@connect.hkust-gz.edu.cn)
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Tutorial: Thur 20:00-20:50, E1-149.

Course Description

This course is the second of a year-long sequence of two introductory courses in one-variable calculus, intended for first year undergraduate students. The emphasis is on the understanding of foundational concepts and practical skills in applying calculus, which are essential for their future study in various fields. Topics include definite and indefinite integrals, numerical calculation, applications to geometry and physics, and infinite series.

Intended Learning Outcomes:

1. Understand the basic concepts and properties of integration and infinite series.
2. Calculate integration symbolically and numerically.
3. Apply integration to solve practical problems.
4. Determine convergence of infinite series.

Pre-requisite: Calculus I or Honors Calculus I

Required Textbook:

- **Thomas Calculus Early Transcendentals. George B. Thomas Jr. etc. 15th Edition, Person.** (https://hkust-gz.primo.exlibrisgroup.com.cn/discovery/fulldisplay?context=PC&vid=86HKUSTGZ_INST:HKUSTGZ&search_scope=MyInst_and_CI&tab=Everything&doci

Reference Books:

- **Calculus. James Stewart. Cengage Learning.** (https://hkust-gz.primo.exlibrisgroup.com.cn/discovery/fulldisplay?context=PC&vid=86HKUSTGZ_INST:HKUSTGZ&search_scope=MyInst_and_CI&tab=Ev

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Weekly Schedule

Week	Topics	ILOs
1-2	Volumes Using Cross-Sections, Volumes Using Cylindrical Shells, Arc Length, Areas of Surfaces of Revolution (6.1-6.4)	ILO-1, ILO-3
3-4	Integration by Parts, Trigonometric Integrals Trigonometric Substitutions, Partial Fraction (8.2-8.5)	ILO-1, ILO-2
5	Improper Integrals (8.8)	ILO-1,ILO-2,ILO-4
6	Parametrizations of Plane Curves, Calculus with Parametric Curves (10.1, 10.2)	ILO-2,ILO-3
7	Polar Coordinates, Areas and Lengths in Polar Coordinates (10.3-10.5)	ILO-2,ILO-3
8	Revision & Midterm Exam	ILO-1,ILO-2,ILO-3
9	Sequences, Infinite Series (9.1, 9.2)	ILO-1,ILO-4
10	Integral Test, Comparison Tests, Absolute Convergence; The Ratio and Root Tests (9.3-9.5)	ILO-1,ILO-2,ILO-4
11	Alternating Series and Conditional Convergence, Power Series (9.6, 9.7)	ILO-1,ILO-4
12	Taylor Series and the Applications (9.8-9.10)	ILO-1,ILO-3,ILO-4
13	Separable Differential Equation, First-Order Differential Equations (16.1-16.3)	ILO-2,ILO-3

Course Assessment Breakdown

- Assignments – 20%
- Midterm Exam – 40%

- Final Exam – 40%

Description:

- Assignments will be given on a weekly basis.
- Midterm exam: **Saturday, 11 Apr, 9:00-11:00, LH?**
- Final exam: **TBA**

Mapping of Course ILOs to Assessment Tasks

Assessed Task	**Mapped ILOs**	**Explanation**
Mid-term exam	[ILO1, ILO2, ILO3]	This task assesses students' understanding of properties of integration (ILO1), mastery of various integration techniques (ILO-2), and the ability to apply the integration techniques to calculate some geometrical objects.
Final exam	[ILO1, ILO2, ILO3, ILO4]	This task evaluates students' comprehension of various integration calculation techniques (ILO-1, ILO-2), applications to geometry and physics (ILO-3), infinite series (ILO-1, ILO-4) and differential equations (ILO-2, ILO-3).
Written assignments	[ILO1, ILO2, ILO3, ILO-4]	The assigments reflect students' understanding of the concepts (ILO1) and the mastery of the calculation techniques (ILO2, ILO-4), and their ability to apply these to solve practical, real-world problems (ILO3).

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within one week of submission. Students who have further questions about the feedback including marks should consult the instructor **within 3 working days after the feedback is received**.

Resubmission Policy

Each assignment can only be assessed once, emphasizing the importance of diligence and thoroughness in initial attempts. For students who seek clarification or have concerns regarding their exam scores, it is imperative to initiate communication with the instructor within a specified timeframe — **3 working days from the receipt of their grades**. This prompt action ensures that any discrepancies or misunderstandings can be addressed in a timely manner.

The decision to grant a reassessment opportunity for a student's exam performance rests solely with the instructor. This discretion allows instructors to consider the individual circumstances surrounding a student's request, such as the nature of any errors or misunderstandings in the initial assessment, the student's overall performance and engagement in the course, and the policies of the academic institution. It underscores the importance of the instructor's role not only in evaluating academic performance but also in fostering a fair and supportive learning environment where students feel their concerns are heard and addressed appropriately.

Final Grade

This course is graded on the total points you achieve.

final grade	A	B	C	D	F
total point range	[85,100]	[70,85)	[55,70)	[35,55)	[0,35)

Grade adjustment will not be considered when more than 60% student achieve B- or higher.

Grades Short Description Elaboration on subject grading description

A	Excellent Performance	Consistently performing at an exceptionally high standard for this level. Has a deep understanding of the knowledge and skills associated with this subject.
B	Good Performance	Consistently performing at a high standard for this level. Has a strong understanding of the knowledge and skills associated with this subject.
C	Satisfactory Performance	Woking at a good standard for this level. Gaining many of the knowledge and skills associated with this subject.
D	Marginal Pass	Woking at a fair standard for this level. Gaining some of the knowledge and skills associated with this subject.
F	Fail	Is currently struggling to master the core skills and understanding associated with this subject at this level.

Canvas Usage Policy

All vital course information and announcements will be posted here regularly throughout the semester. Students are expected to check this page 2-3 times per week in order to stay informed.

Course AI Policy

The direct use of generative artificial intelligence (AI) tools in examinations or assignments should be prohibited.

These tools can produce detailed responses and solutions without demonstrating user’s own understanding or problem-solving process. The purpose of exams and assignments is to assess the individual's knowledge, comprehension, and ability to apply what they have learned. Using AI tools circumvents this process, undermining the educational objectives of developing critical thinking, problem-solving skills, and deep understanding of Calculus. Students are allowed to use such AI tools only as supplementary aids, if permitted, for learning but not for assessment purposes.

Academic Integrity Policy

Students are expected to adhere to the university’s academic integrity policy. Students are expected to uphold HKUST(GZ)’s Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Regulations for Academic Integrity and Student Conduct for the University’s definition of plagiarism and ways to avoid cheating and plagiarism.

Non-discriminatory Language & Conduct

This course encourages non-discriminatory language and conduct. Students should not use racist, sexist or other discriminatory language in class discussions or written work.

Course Summary:

Date	Details	Due
Thu Aug 7, 2025	Final Exam (https://hkust-gz.instructure.com/courses/2890/assignments/19931)	due by 11:59pm
Fri Feb 6, 2026	Assignment 1 (https://hkust-gz.instructure.com/courses/2890/assignments/19921)	due by 12pm
Mon Mar 9, 2026	Assignment 2 (https://hkust-gz.instructure.com/courses/2890/assignments/20445)	due by 12pm
Sat Apr 11, 2026	Midterm Exam (https://hkust-gz.instructure.com/courses/2890/assignments/19932)	due by 11am