

## Course Outline of MAT1002: Calculus II (L06)

Monday and Wednesday, 1:30 PM – 3:20 PM, TB 201

### Course Instructor

Ming Yan

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Office: Daoyuan 410

Office Hours: To Be Announced.

Appointments may also be set up via emails.

### Course Description

This course is a continuation of Calculus I, covering infinite series and multivariable calculus. It emphasizes intuitive and conceptual understanding of theory of series and multivariable calculus, as well as computation skills; it cultivates the ability to use Calculus to solve problems within mathematics and from other scientific disciplines.

### Course Material

**[Textbook]** *Thomas' Calculus (13th Edition in SI Units)*, George B. Thomas Jr., Maurice D. Weir, Joel R. Hass.

Publisher: Pearson.

**[Reference Book]** *Calculus: Early Transcendentals (8th Edition)*, James Stewart.

Publisher: Brooks Cole.

Additional supplementary notes may be posted on **Blackboard** (<https://bb.cuhk.edu.cn>).

### Lecture Notes

[https://cuhko365-](https://cuhko365-my.sharepoint.com/:f:/g/personal/yanming_cuhk_edu_cn/Eo9TYRh4f_BEmII3RAwe6h4B4VJwqqkTnodR4LQgG1Fjuw?e=SP12hg)

[my.sharepoint.com/:f:/g/personal/yanming\\_cuhk\\_edu\\_cn/Eo9TYRh4f\\_BEmII3RAwe6h4B4VJwqqkTnodR4LQgG1Fjuw?e=SP12hg](https://cuhko365-my.sharepoint.com/:f:/g/personal/yanming_cuhk_edu_cn/Eo9TYRh4f_BEmII3RAwe6h4B4VJwqqkTnodR4LQgG1Fjuw?e=SP12hg)

### Course Assessment

Assignments: 20%

Quizzes: 10%

Midterm examination: 30% (Tentative midterm date and time: 9:30 – 11:30 AM, Saturday, March 23)

Final examination: 40%

## **Teaching Assistants (TA) and Tutorial Sections**

To Be Announced.

## **Tutorials**

In addition to lectures, each student is assigned with an 80-minute tutorial each week.

- Tutorials will start on January 16.
- Tutorials will be conducted by teaching assistants (TAs).
- During the tutorials, TAs will go over some assignment problems (additional examples may be presented if time permits).
- Quizzes will be conducted in tutorials.
- You must attend your assigned tutorial section (i.e., if you are in Tutorial T03, you CANNOT attend T01), or your quiz grades will NOT be recorded.

## **Quizzes**

- There will be four 30-minute quizzes in total. Quiz dates are:
  - Quiz 1: Jan 22 – 26 (Week 3)
  - Quiz 2: Mar 4 – 8 (Week 6)
  - Quiz 3: Apr 8 – 12 (Week 11)
  - Quiz 4: Apr 22 – 26 (Week 13)
- There **will not be any make-up quizzes for any reason**. Instead, to compensate for special situations (including, but not limited to, sickness, injury, stress, and family emergency) while keeping logistic simplicity, **your lowest quiz score will not be counted toward the term grade** (i.e., only your best three will count).

## **Assignments**

- There will be 12 assignments for marks in total. Assignments will be announced weekly.
- Assignments should be submitted online to **Blackboard** (<https://bb.cuhk.edu.cn>).

- **No late submission will be accepted.** Instead, to compensate for special situations (including, but not limited to, sickness, injury, stress, and family emergency) while keeping logistic simplicity, **your lowest assignment score will not be counted toward the term grade.**
- To avoid internet traffic jam, you are strongly encouraged to submit your solution at least two hours before the deadline. Please also pay attention on the submission confirmation emails from Blackboard, and make sure that your file has the correct PDF subfix and is openable --- we will not be responsible for any improper submissions, including **but not limited to** those due to last-minute slow internet speed, **incorrect file format**, and **forgot-to-press-the-button**. One-minute late = late.
- No solution will be posted for the assignments. (Use the tutorials and office hours wisely!)

### Policy of Assignments/Quizzes/Exams

- You are allowed (and encouraged) to discuss the assignment problems with your classmates, but you should always write your own solution independently. Direct copying or slight changes in symbols would be considered cheating; any cheating cases will result in a grade of zero and may be reported to the Academic Disciplinary Committee.
- There **will not be any make-up midterm.**
- **Make-up final exam is only possible if the absent student could provide a strong valid reason with formal documental proof and has his/her application submitted within five working days since the examination day,** and it is subject to the approval of your instructor and the registry office. (Remembering the wrong exam time, setting the alarm time incorrectly, having depressions and pressures from other exams and activities, etc., are not considered valid reasons.)
- The make-up final exam must be held within 15 days since the regular exam date.
- **All quizzes and exams are close-book; notes, calculators and dictionaries will NOT be allowed.**

### Grade Appeal Policy

- After the release of the grade for each assignment, you may have questions or doubt regarding the marking (e.g., why did I only get two points out of three for this question?). You may express your concern to the marker via emails and ask for a reason. If there is a marking mistake, your grade can be corrected. **However, any such appeal must be done within two weeks since the grade release date. After that, your assignment grade will not be changed even if there is a marking mistake.**

- Appeal regarding the midterm exam marking must be done **within two weeks** after the paper return date. **After that, your midterm grade will not be changed even if there is a marking mistake.**
- Once the official course letter grade is released on the SIS (Student Information System), all concerns regarding the final exam grade and the course grade must be raised to your instructor formally via email **within two weeks** since the grade release date. **Appeals that are raised after the deadline will not be handled.**

## **Course Contents**

This course will cover most contents in Chapters 10 to 16 in the textbook, except 11.6, 11.7, 13.5, 13.6, 14.10, and 15.6. The following is an outline of the course contents, which may be adjusted slightly as the term progresses.

- Sequences, infinite series, integral test, and comparison test.
- Absolute convergence, ratio and root tests, alternating series and conditional convergence, power series.
- Taylor polynomials and expansions, applications of Taylor series.
- Parametrizations and calculus of plane curves, polar coordinates, areas and lengths in polar coordinates.
- Vectors, dot products, cross products, lines and planes in space, cylinders and quadratic surfaces.
- Space curves and tangents, integrals of vector functions, arclength of space curves, curvature and normal vectors of curves.
- Limits and continuity of functions of several variables, partial derivatives, chain rule, directional derivatives and gradient vectors.
- Tangent planes and differentials, extreme values and saddle points, Lagrange multipliers, Taylor's formula for two variables.
- Double and iterated integrals, area by double integration.
- Double integrals in polar coordinates, triple integrals in rectangular coordinates, cylindrical coordinates, spherical coordinates, substitution method in multiple integrals.
- Line integrals, work, circulation and flux, path independence, conservative fields, potential functions.
- Green's Theorem, surfaces and area.
- Surface integrals, Stokes' Theorem.
- Divergence Theorem and a unified theory.