



**Shih Chien University**  
**STP Program (June 02-July 04)**  
**MATH 230 Calculus III**  
**Course Outline**

**Course Code: MATH 230**

**Instructor: TBA**

**Home Institution: TBA**

**Office Hours: TBA and by appointment**

**Email: TBA**

**Credits: 4**

**Class Hours:** This course will have 144 class hours, including 50 lecture hours, professor 30 office hours, 20-hour TA discussion sessions, 10-hour review sessions, 34-hour extra classes.

**Prerequisites:** Calculus I and Calculus II

**Course Description:**

This is the third course in the calculus sequence, offering a comprehensive introduction to multivariable calculus. Topics include functions of several variables, differential and integral calculus in two and three dimensions, and applications. The course also covers vectors and the geometry of curves and surfaces in three-dimensional space.

**Course Objectives:**

The course aims to build a solid understanding of calculus involving two and three variables, along with vector geometry. It is designed for students pursuing further studies in mathematics, physics, engineering, computer

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science, or other quantitative fields such as economics and finance.

### Course Textbooks:

*Calculus: Early Transcendentals* (8th Edition) by James Stewart, with WebAssign Access Code.

Available for purchase directly at:

<https://www.cengage.com/c/calculus-early-transcendentals-8e-stewart/9781337771498#compare-buying-options>

### Important Note:

You must purchase both the textbook and the WebAssign access code. The WebAssign code is required to complete homework assignments.

### Homework:

Homework will be assigned online through WebAssign for each section of the textbook. Assignments will be posted several days before the material is covered in class, with due dates typically set two to three days after the section is taught. Each question allows up to five attempts.

### Grading & Evaluation:

Attendance and participation:	10%
Homework:	30%
Midterm:	30%
Final:	30%

Grading System (1 ~ 100):

A+ : 96 - 100	A : 91 - 95
B+ : 86 - 90	B : 81 - 85
C+ : 76 - 80	C : 71 - 75
D+ : 66 - 70	D : 60 - 65
F : 0 - 59	
Pa : Pass	Fa : Fail

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## Course Schedule:

### Week 1:

- Introduction to the course
- Vectors in three dimensions
- Dot and cross products
- Lines and planes in three-dimensional space
- Implicit and parametric surfaces
- Cylinders and quadratic surfaces
- Vector functions
- Derivatives and integrals of vector functions
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### Week 2:

- Arc length and curvature
- Functions of several variables
- Limits and continuity
- Partial derivatives
- Tangent planes and linear approximations
- Differentiability
- The chain rule
- Gradient and directional derivatives
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### Week 3:

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- Midterm Exam
- Maxima and minima
- Lagrange multipliers
- Double integrals
- Double integrals in polar coordinates
- Surface area of a solid of revolution
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### Week 4:

- Surface area
- Triple integrals
- Vector fields

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- Line integrals
- The Fundamental Theorem of Line Integrals
- Green's Theorem
- Curl and divergence
- Surface integrals
- Stokes' Theorem
- The Divergence Theorem
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### **Week 5:**

- Discussion Session
- Review Session
- Final Exam

### **Student Responsibilities and Expectations**

The primary content for this course will be delivered through lectures, with additional support available in weekly discussion sessions held every Friday, led by a teaching assistant (TA). These sessions provide students the opportunity to engage in in-depth discussions of course concepts and problem-solving activities.

Students are expected to keep up with the pace of the course by attending all lectures and discussion sessions punctually, and by dedicating ample time to complete assigned homework and lab exercises. In the event of an unavoidable absence, students are responsible for obtaining lecture notes and reviewing the material before the next class. Active engagement, including asking questions and seeking help when needed, is encouraged to ensure a solid grasp of the material.

Students should arrive prepared, having reviewed prior material and ready to contribute thoughtfully to discussions. All electronic devices should be turned off, and unrelated materials set aside to minimize distractions. Professionalism and respect for peers and instructors are essential; late arrivals and early departures from class will not be permitted.