

MATH 502 Advanced Calculus for Engineers Spring 2004

Course Information:

- **Class Location & Time:** Sec 1- EB1010, MW 1:30-2:45pm, Sec 2- PH0304, MW 6:00-7:15pm
- **Instructor:** Dr. Koung Hee Leem, kleem@siue.edu, 650-2366, SL 1331,
Office Hours : MW 9:30-10:30am, 3:00-4:30pm or by appointment.

Course Website: <http://www.siu.edu/~kleem/math502.html>

Pay close attention to the course website. Homework assignments and other information will be posted.

Textbook: *Advanced Engineering Mathematics, 2nd Edition* by Sill and Cullen.
Student Solution Manual is available in bookstore.

Prerequisite: Not for math majors. MATH 250 with a grade of C or consent of instructor.

Course Description:

This course is about the fundamental concepts of advanced calculus. The course covers review of vector calculus, Green's theorem, Stokes' theorem, Complex analysis up to contour integrals and residue theorem.

1. *Chapter 9*, Brief Review
Review on Vector Functions, Motion on a Curve, Curvature and Components of Acceleration, Function of Several Variables, The Directional Derivative, Planes and Normal Lines, Divergence and Curl, Line Integrals. Line Integrals Independent of the Path, Double Integrals, Double Integrals in Polar Coordinates, Green's Theorem, Surface Integrals, Stokes' Theorem, Triple Integrals, Divergence Theorem, Change of Variables in Multiple Integrals.
2. *Chapter 17*, Functions of a Complex Variable
Complex Numbers, Forms of Complex Numbers, Sets of Points in Complex Plane, Functions of a Complex Variable, Cauchy-Riemann Equations, Exponential and Logarithmic Functions, Trigonometric and Hyperbolic Functions, Inverse Trigonometric and Hyperbolic Functions.
3. *Chapter 18*, Integration in the Complex Plane
Contour Integrals, Cauchy-Goursat Theorem, Independent of Path, Cauchy's Integral Formula.
4. *Chapter 19*, The Series and Residues
Sequences and Series, Taylor Series, Laurent Series, Zeros and Poles, Residues and Residue Theorem, Evaluation of Real Integrals.

5. *Chapter 20, Conformal Mapping and Applications*
Complex Functions as Mappings, Conformal Mapping and the Dirichlet Problem.

Grading Scheme:

The final grade is based on standard grading scale: 100-90 A, 89-80 B, etc., and it will be based on exams and homework assignments, as follows:

20%	4 or 5 Homework assignments
40%	Two Midterms
40%	Final("Comprehensive")

Important Notes:

- Attendance at the class is required. Try to arrive ON TIME to each class meeting. When a class is missed, the student is responsible for material covered in class.
- Late Homework is not accepted.
- All works on exams and assignments must be your own. The university has a straight forward policy on academic integrity.
- Make-up may be given for exams missed due to unavoidable circumstances and compelling situations which are documented.
- Incomplete will not be given as an alternative to a withdrawal.
- The course plan may be modified during the semester. All changes will be announced in class in advance. It is the student's responsibility to be informed of such announced changes.
- Students needing special academic accommodations and who have documented disabilities should make an appointment to discuss these accommodations. Students with disabilities are also encouraged to visit the SIUE Disability Support Services office located in Rendleman Hall, room 1218.

Important Dates:

The last day to withdraw without receiving a grade is January 23. The last day to withdraw from a class without permission of advisor and instructor is March 26. After March 26, but before April 16, students may withdraw from a class but will receive a grade of WP or WE. To receive a WP, you must have a percentage of 60% or above when you drop.