

Georgia Institute of Technology
Math 2605 - Calculus III for Computer Science – Fall 2010

	<u>Room</u>	<u>Days</u>	<u>Time</u>
Lecture (D1,D2)	Skiles 202	TR	9:35am – 10:55am
Recitation (D1)	Skiles 256	MW	10:05am – 10:55am
Recitation (D2)	D. M. Smith 207	MW	10:05am – 10:55am

Instructor: Anton Leykin, see webpage for office hours

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Teaching Assistants:

Section D1: Becca Winarski rwinarski@math.gatech.edu

Section D2: Ke Yin kyin@math.gatech.edu

Texts:

Required:

- Notes by Eric Carlen (see webpage);
- Salas, Hille, and Etgen, *Calculus: One & Several Variables*, 10th edition;

Recommended:

- Notes on linear algebra (see webpage);
- Olver and Shakiban, *Applied Linear Algebra*.

Prerequisites and Description: Math 2605 is an introduction to multivariable calculus and linear algebra. Topics covered include: Topics in linear algebra and multivariate calculus and their applications in optimization and numerical methods.

Prerequisites for the course are Math 1502 or Math 1512 or (Math 15X2 + Math 1522).

Attendance and make-up exams: Attendance is required for all lectures. The student who misses a class meeting is responsible for any assignments and/or announcements made. *In the event of an absence due to travel representing Georgia Tech, such as an intercollegiate sports competition, you must notify the professor at least two weeks in advance to arrange an early test or other alternative.* Otherwise, such absences will be treated as personal.

Homework: This course will have daily homework assignments, which should be done before the next class. Homework will not be collected, however, being able to solve homework problems will be crucial for successful performance on quizzes and exams.

Quizzes: There will be quizzes every Wednesday except the weeks of mid-term exams and the last week of classes.

Exams: This course will have 2 mid-term exams, and a comprehensive final exam. The exams for the course will take place on:

Exam 1	Sep 23 (Thu)
Exam 2	Oct 28 (Thu)
Final Exam	Dec 16 (Thu) 8:00am - 10:50am

Projects: You may turn in *two* or *three* computer projects by the following deadlines:

Project 1	Oct 2 (Sat) 11:00pm
Project 2	Nov 6 (Sat) 11:00pm
Project 3	Nov 21 (Sat) 11:00pm

Please, complete at most one project per deadline; if you are planning to complete two projects, then you may aim for any two of the deadlines above. If three projects are submitted, two best scores will count. The list of potential projects and detailed instructions will be posted on the course web-page.

Calculators: By default calculators are not allowed.

Learning Disabilities: It is the right of any student with a certified learning disability to request necessary accommodation. Such requests must be made well in advance of the time that the accommodation is required and a letter of documentation from the **ADAPTS** office must be presented at the time of any request.

Academic Honesty: It is expected that all students are aware of their individual responsibilities under the **Georgia Tech Academic Honor Code**, which will be strictly adhered to in this class.

Additional Resources: In addition to the textbook, lectures, and office hours there are other resources available that might be of use for you during the course. All Georgia Tech students are eligible for 1-on-1 tutoring, see the website associated with the **Office of Success Programs**. There is also the **Math Lab** in the School of Mathematics where tutoring services are provided. Links to more resources are posted on the webpage.

Grades: The usual ten-point scale will be used (A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: 0-59%), however, if necessary, adjustments will be made to arrive at a standard grade distribution. Grades will be based upon quizzes (Q), the mid-term exams (E1, E2), projects (P), and the final exam (F) and the total scores will be computed using the following formula: $E1 + E2 + Q + P + 2F$, where maximal values of all symbols are equal to 100. (Each quiz is 10 points, 10 best quizzes count. Each project is worth 50 points, two best projects count.)

Tentative list of topics:

- Parametric (explicit) and equational (implicit) presentation of lines and planes.
- Decomposition of a vector into the parallel and orthogonal parts with respect to another vector, reflections, distances (point to line, point to plane), distance between two lines.
- Vector functions, curves.
- Functions of several variables, partial derivatives, gradient, level sets.
- Linearization of functions, gradient, Jacobian, Newton's method.
- Critical points, Hessian, local minima and maxima.
- Optimization with constraints, Lagrange's method.
- Diagonalization of symmetric matrices.
- Singular value decomposition.
- Schur factorization.
- Householder and Givens methods for QR.
- Iterative methods for eigenvalues/vectors.
- Integrals of functions of two variables, changing coordinates.
- Applications of integrals (area, centroid, mass).

Important Dates for Fall 2010:

Aug 23	First day of classes
Aug 27	Last day to register
Sep 6	No class
Oct 15	Last day to drop individual courses with a grade of "W" by 4:00 pm ET
Oct 18-19	No classes
Oct 31	Last day to withdraw from school with "W" grades in all courses by 4:00 pm ET
Nov 25-26	No classes
Dec 10	Last day of classes