

# Math 153: Calculus and Analytic Geometry III

Autumn Quarter 2008

MWF 12:30 pm in **Arps Hall AP 0383**

Call number: 13229-A

General information:

· Course description: Math 153 is a continuing course in Calculus, covering the theory of infinite series, analytic geometry in the plane and the space, and the introductory vector analysis. Its goal is to develop further some of the fundamental notions and techniques in calculus, and to provide students a solid foundation in mathematical analysis. Student participation is emphasized.

· Lecturer: Keyan Yang, [kyyang@math.ohio-state.edu](mailto:kyyang@math.ohio-state.edu)

· Office: MW 649.

· Office hours: MWF 11:30 am - 12:30 pm, and by appointment.

Textbook: Calculus: Early Transcendentals by James Stewart, Volume 2, OSU edition.

Homework:

An assignment will be made after each lecture to be handed in during the recitation on the next Tuesday. Before handing in your homework paper, please put your name, the recitation time, the chapter and section number, and the date on the upper right corner of the first page (on each page if not stapled).

Exams:

There will be two midterm exams and the comprehensive final exam during the quarter. The two midterms will take place during regular class period, on October 24 (Fri) and November 19 (Wed) respectively. Final exam will be held on December 8 (Mon.), 11:30am - 1:18pm, in the usual lecture room.

Grading:

Course grades will be based on the average of the scores on the two midterm exams (each will be counted as 25%), the final exam (40%), and the Recitation (10%).

Class Schedule and Homework Assignments

Lecture 1 (Sept 24, Med.). §11.1, Sequences.

HW. §11.1, 12, 18, 19, 20, 22, 29, 34, 40, 46, 62.

Lecture 2 (Sept 26, Fri.). §11.2, Series.

HW. §11.2, 15, 20, 23, 24, 26, 31, 33, 49.

Lecture 3 (Sept 29, Mon.). §11.3, The integral test and estimates of sums.  
HW. §11.3, 4, 7, 12, 17, 22, 33.

Lecture 4 (Oct 1, Wed.). §11.4, The comparison tests.  
HW. §11.4, 6, 8, 9, 16, 20, 26, 28, 31, 36.

Lecture 5 (Oct 3, Fri). §11.5, Alternating series.  
HW. §11.5, 4, 5, 8, 14, 17, 18, 23.

Lecture 6 (Oct 6, Mon.) §11.6, Absolute convergence, and the ratio and root tests.  
HW. §11.6, 3, 4, 8, 10, 12, 18, 22, 23, 33.

Lecture 7 (Oct 8, Wed.). §11.7, Strategy for testing series.  
HW. §11.7, 4, 5, 7, 9, 22, 24, 29, 33, 34, 37.

Lecture 8 (Oct 10, Fri.) . §11.8, Power series.  
HW. §11.8, 4, 6, 8, 11, 17, 18, 19, 21.

Lecture 9 (Oct 13, Mon.). §11.9, Representations of functions as as power series  
HW. §11.9, 3, 6, 8, 9, 13, 21, 23, 24, 32.

Lecture 10 (Oct 15, Wed.). §11.10, Taylor and Maclaurin series.  
HW. §11.10, 4, 5, 9, 11, 18, 21, 29, 43, 47, 49.

Lecture 11 (Oct 17, Fri.). §11.11, The binomial series.  
HW. §11.11, 1, 4, 5, 11.

Lecture 12 (Oct 20, Mon.). §11.12, Applications of Taylor polynomials.  
HW. §11.12, 14, 16, 17.

Lecture 13 (October 22, Wed.). Review.

Lecture 14 (October 24, Fri.). Midterm 1.

Lecture 15 (Oct 27, Mon.). §10.1, Curves defined by parametric equations.  
HW. §10.1, 2, 7, 10, 12, 14, 16, 41.

Lecture 16 (Oct 29, Wed.). §10.2, Calculus with parametric curves.  
HW. §10.2, 4, 19, 25, 31, 34, 41, 44, 59, 61.

Lecture 17 (Oct 31, Fri.). §0.3, Polar coordinates.  
HW. §10.3, 18, 20, 22, 25, 31, 33, 37, 39, 42.

Lecture 18 (Nov. 3, Mon.). §10.4, Area and lengths in polar coordnates.  
HW. §10.4, 6, 8, 14, 23, 28, 29, 45, 48.

Lecture 19 (Nov 5, Wed.). §12.1, Three-dimensional coordinate

systems.

HW. §12.1, 5, 7, 18.

Lecture 20 (Nov 7, Fri.). §12.2, vectors.

HW. §12.2, 4, 16, 20, 22, 25, 26.

Lecture 21 (Nov 10, Mon.). §12.3, The dot product.

HW. §12.3, 6, 10, 18, 22, 24, 32, 40, 41, 52.

Lecture 22 (Nov 12, Wed.). §12.4, The cross product.

HW. §12.4, 2, 5, 24, 26, 28, 29, 31, 34.

Lecture 23 (Nov 14, Fri.). §12.5, Equations of lines and planes.

HW. §12.5, 3, 8, 12, 16, 28, 33, 34, 52, 66, 68.

Lecture 24 (Nov 17, Mon.). Review.

Lecture 25 (Nov 19, Wed.). Midterm #2.

Lecture 26 (Nov 21, Fri.). §12.6, Cylinders and quadric surfaces.

HW. §12.6, 1, 8, 9, 21-28, 36.

Lecture 27 (Nov 24, Mon.). §12.7, Cylindrical and spherical coordinates.

HW. §12.7, 4, 12, 14, 22, 37, 40, 41, 46, 53, 58.

Lecture 28 (Nov. 26, Wed.). §13.1, The vector functions and space curves.

HW. §13.1, 4, 5, 6, 11, 12, 17, 19, 24, 25.

Lecture 29 (Dec. 1, Mon.). §13.2, Derivatives and integrals of vector functions.

HW. §13.2, 9, 10, 15, 17, 21, 24, 25, 33, 36, 40.

Lecture 30 (Dec 3, Wed.). §13.3, Arc length and curvature.

HW. §13.3, 2, 3, 4, 10, 15, 19, 39.

Lecture 31 (Dec 5, Fri.). Review