

Mathematics 161.01H Au
Mathematics 162.01H Wi
Mathematics 263.01H Sp

5 cr. Each

**Accelerated Calculus
with Analytic Geometry**

Prerequisite:

161.01H - Credit for Math 151, or satisfactory score on Department Qualifying Exam.

162.01H - 161.01H with a grade of C or better or written permission of Honors Committee chair.

263.01H - 162.01H with a grade of C or better or written permission of Honors Committee chair.

Catalog Description:

The catalog descriptions for 161.01H, 162.01H, and H163 are the same as those for 161.01, 162.01, and 263.01 (respectively) - see listing for those courses.

HOWEVER - these descriptions as currently listed in the University Bulletin are not correct; for a more accurate description of their content, see "Topics" section below.

Purpose of Course:

This sequence is the honors version of the accelerated calculus sequence 161.01, 162.01, 263.01; it is *designed for students with credit for Math 151*. These courses are taught daily by faculty members in small classes with considerable student-teacher interaction. Students in this sequence will be held to higher standards of mathematical rigor than those in non-honors versions; they will be expected to demonstrate mastery of definitions and statements and proofs of theorems. Math 161.01H is a substitute for 151.01 and 152.01, 162.01H for 153.01, and 263.01H for 254.01.

Follow-up Course:

After completing 263.01H concurrently with 345, students will be ready for Math 520H, 521H and 522H (or various other courses in linear algebra, analysis or differential equations).

Text:

Calculus with Analytic Geometry, 2nd edition, by Simmons, McGraw-Hill, ISBN 007057624

NOTE: The textbooks for the Math 161.01 sequence and Math 151.01 sequence are not the same as 161.01H.

Topics:

161.01H. The concept of the limit, continuous functions, differentiation, the Mean Value Theorem, implicit functions, derivatives of higher orders, applications of derivatives, integral calculus of the polynomial, logarithmic, exponential and trigonometric functions, integration techniques and applications.

162.01H. L'Hospital's rule, improper integrals, sequences and series, convergence tests, power series, Taylor's formula, conic sections, polar coordinates and their applications, parametric equations of curves, vector algebra in the plane and three-dimensional space, derivatives of vector functions, curvature and the unit normal vector, tangential and normal components of acceleration, analytic geometry of three-dimensional space.

263.01H. Partial derivatives, the tangent plane to a surface, directional derivatives and the gradient, the chain rule for partial derivatives, maximum and minimum problems, Lagrange multipliers, multiple integrals and their applications, cylindrical and spherical coordinates, areas of surfaces, line and surface integrals, Green's theorem, Divergence theorem, Stokes' theorem.