

Marshall University

College of Science

Mathematics Department

MTH 140H: Applied Calculus Honors

Course catalog description

A brief survey of calculus including both differentiation and integration with applications. This honors course will also introduce topics from differential equations with applications.

Credit hours

3 hours

Prerequisites

ACT Math 25 or a grade of C or higher in MTH 127 or MTH 130

List of topics

1. Differentiation

- Limits and continuity.
- Rates of change.
- Techniques of differentiation--power, sum, difference, product, quotient, and chain rules.
- Implicit differentiation.
- Higher derivatives.
- Graph sketching.
- Extrema--maxima and minima.
- Related rates.
- Special applications such as Poiseuille's law, sensitivity to drugs, and population growth.

2. Integration

- Antiderivatives and the definite integral.
- The Fundamental of Integral Calculus.
- Techniques of integration--substitution, integration by parts, partial fractions.
- Tables of integrals.
- Numerical approximation of integrals.
- Applications of the integral and solutions of elementary differential equations.

3. Differential equations

- Ordinary differential equations; solutions
- Systems of ODEs
- Applications; modeling with systems of ODEs

Suggested textbooks

- Larson, *Applied Calculus for Life & Social Sciences*, ISBN 978-0-618-96259-4
- Greenwell, Ritchey, Lial, *Calculus for the Life Sciences*, second edition.

Last updated

December 2016