MTH 212 - MULTIVARIATE CALCULUS - STUDY GUIDE FOR FINAL EXAM

No books, notes, calculators, or cell phones are permitted during the test!

Use notes, text, homework, and suggested exercises to prepare for the test.

You will be required to use the lockdown browser on live.wilkes.edu and a scanning app (or scanner) to upload your written exam solutions to a folder on live.wilkes.edu within 20 minutes right after the test.

Note that it is a cumulative exam that covers all the material described in Study Guides for Exams I-IV, and the material from Sections 15.4 - 15.8.

Topics since Exam IV (some formulas will be provided on a formula sheet - make sure to check it):

- Section 15.4 *Green's Theorem in the Plane.*

  Definitions of curl, circulation density (or **k**-component of the curl) and divergence (or flux density).
  2D problems using Green's theorem: know two formulations (one for circulation and one for flux) and use them for: turning a line integral around a closed smooth curve into a double integral over the interior of the curve or vice versa.

- Section 15.5 *Surfaces and Area.*

  Know how to parameterize basic surfaces or their portions (spheres, cones, planes, cylinders). (Any complicated parameterizations and figures will be provided.)
  Ignore implicitly defined surfaces.
  Know how to compute surface area of a parameterized surface.

- Section 15.6 *Surface Integrals.*

  Know how to integrate a function over a surface (no implicitly defined surfaces).
  Know how to compute flux of a vector field across a smooth oriented surface using a surface integral.

- Section 15.7 *Stokes' Theorem.*

  Know how to set up both sides of the equation - one line integral along the boundary of a surface, one surface integral; and use one integral to evaluate the other (for instance, compute circulation using flux of curl or vice versa).

- Section 15.8 *Divergence Theorem.*

  Know how to set up both side of the equation - one surface integral, one triple integral over a solid; and use one integral to evaluate the other (for instance, compute flux using divergence integral or vice versa).