

## MATH2231 - Calculus III

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| Credits:           | 4 (4/0/0)   |
| Description:       | Meets MnTC Goal Areas 2 and 4. The course content includes a study of vectors in the plane and space, differentiation and integration of vector-valued functions, and partial differentiation, multiple integrals, including line and surface, in rectangular, polar, cylindrical, spherical and other systems, and a study of Stokes' Theorem, Green's Theorem, and the Divergence Theorem.  |
| Prerequisites:     | <ul style="list-style-type: none"> <li>• MATH1135</li> </ul>  |
| Corequisites:      |   |
| Pre/Corequisites*: |   |
| Competencies:      | <ol style="list-style-type: none"> <li>1. Interpret vector operations geometrically in two and three dimensions.</li> <li>2. Evaluate the limits of vector-valued functions.</li> <li>3. Perform dot products and cross products of two vectors.</li> <li>4. Differentiate and integrate vector-valued functions.</li> <li>5. Relate planes in space with parametric equations.</li> <li>6. Define the equations of surfaces in space.</li> <li>7. Evaluate the limits and continuity of multivariable functions.</li> <li>8. Differentiate multivariable functions.</li> <li>9. Develop directional derivatives and gradients.</li> <li>10. Investigate Lagrange Multipliers to solve problems with constraints.</li> <li>11. Produce triple integrals in rectangular, cylindrical, and spherical coordinates and other change of variable systems.</li> <li>12. Analyze vector fields, line, and surface integrals.</li> <li>13. Investigate Green's Theorem, Stokes Theorem and the divergence of a vector field.</li> </ol> |
| MnTC goal areas:   | <ol style="list-style-type: none"> <li>2. Critical Thinking</li> <li>4. Mathematics/Logical Reasoning</li> </ol>  |

\*Can be taking as a Prerequisite or Corequisite.