



<b>Course Number</b>	Math 3375 Numerical Computing (WIC)
<b>Course Name</b>	
<b>Credit Value (Breakdown of theory and lab credits)</b>	3 Theory
<b>Catalog Course Description</b>	This course will cover solutions of nonlinear equations of one variable, solutions of linear equations in many variables (matrices), interpolation, techniques for approximation of integration and differentiation of functions, computational solutions of initial-value problems for ordinary differential equations, and programming with mathematical software. Students will be responsible for writing technical papers with citations describing the results of numerical computation. Prerequisite: MATH 1520 and a computer language. (3, 3T+0L)
<b>Course Student Learning Outcomes/Objectives /Competencies of the Course</b>	<p><b>Student Learning Outcomes:</b> At the end of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Find roots of non-linear equations             <ol style="list-style-type: none"> <li>2. Bisection</li> <li>3. Newton-Rhapson</li> <li>4. Secant</li> </ol> </li> <li>2. Interpolate functions using             <ol style="list-style-type: none"> <li>1. Lagrange polynomials</li> <li>2. Hermite polynomials</li> <li>3. Cubic splines</li> </ol> </li> <li>3. Numerically differentiate functions</li> <li>4. Numerically integrate functions with             <ol style="list-style-type: none"> <li>1. Trapezoid rule</li> <li>2. Simpsons rule</li> </ol> </li> <li>5. Solve initial-value problems             <ol style="list-style-type: none"> <li>1. Euler's method</li> <li>2. Runge-Kutta</li> </ol> </li> <li>6. Solving linear equations             <ol style="list-style-type: none"> <li>1. Gaussian elimination</li> <li>2. Iterative methods</li> </ol> </li> </ol>
<b>College-Wide Student Learning Outcomes</b>	<p>Math 3375 exposes students to the following NNMCC College Wide Goals:</p> <p><i>Critical thought: Students are required to analyze and synthesize information and draw reasoned conclusions.</i></p> <p><i>Quantitative reasoning: Calculate, represent, apply, analyze, and communicate both quantitative and qualitative information.</i></p>
<b>Program Student Learning Outcomes measured</b>	<p>PSLO #6: Use computational programming and numerical analysis to solve a mathematical problem.</p> <p>PSLO #7: Write a scientific paper with citations to describe the results of a mathematical computation or research project.</p>