

<b>Dept Number</b>	<b>MATH/CS 475a</b>	<b>Course Title</b>	<b>Numerical Analysis</b>							
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Math Department</b>							
<b>Catalog Description</b>	A practical introduction to the theory and techniques for computation with digital computers. Topics include: the solution of nonlinear equations; interpolation and approximation; solution of systems of linear equations; numerical integration, solution of ordinary differential equations; computation of Eigen values and eigenvectors; and solution of partial differential equations. Students will use MATLAB to study the numerical performance of the algorithms introduced in the course.									
<b>Textbooks</b>										
Numerical Analysis by Richard L. Burden and J. Douglas Faires, 8th ed.										
<b>References</b>										
<b>Course Learning Outcomes</b>										
<ul style="list-style-type: none"> <li>To learn the theory and practice of numerical computation.</li> </ul>										
<b>Assessment of the Contribution to Program Outcomes</b>										
<b>Outcome →</b>	1	2	3	4	5	6	7	8	9	10
<b>Assessed →</b>	X									X
<b>Prerequisites by Topic</b>										
(a) Mathematics 221 and 250 (b) 475a and Mathematics 305.										

**Major Topics Covered in the Course**

1. The nature of digital computing {2 classes}
2. Taylor's formula {1 class}
3. Discrete methods {3 classes}
4. Root finding {9 classes}
5. Interpolation {6 classes}
6. Approximation of functions {9 classes}
7. Numerical solution of  $Ax=b$  {10 classes}

<b>Dept Number</b>	<b>MATH/CS 475b</b>	<b>Course Title</b>	<b>Numerical Analysis</b>							
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Math Department</b>							
<b>Catalog Description</b>	A practical introduction to the theory and techniques for computation with digital computers. Topics include: the solution of nonlinear equations; interpolation and approximation; solution of systems of linear equations; numerical integration, solution of ordinary differential equations; computation of Eigen values and eigenvectors; and solution of partial differential equations. Students will use MATLAB to study the numerical performance of the algorithms introduced in the course.									
<b>Textbooks</b>										
Numerical Analysis by Richard L. Burden and J. Douglas Faires, 8th ed.										
<b>References</b>										
<b>Course Learning Outcomes</b>										
<ul style="list-style-type: none"> <li>To learn the theory and practice of numerical computation.</li> </ul>										
<b>Assessment of the Contribution to Program Outcomes</b>										
<b>Outcome →</b>	1	2	3	4	5	6	7	8	9	10
<b>Assessed →</b>	X									X
<b>Prerequisites by Topic</b>										
(a) Mathematics 221 and 250 (b) 475a and Mathematics 305.										

**Major Topics Covered in the Course**

1. Numerical quadrature {10 classes}
2. Numerical solution of ordinary differential equations {12 classes}
3. The algebraic Eigen value problem {9 classes}
4. Numerical solution of elliptic BVP's {9 classes}