Course number, title and credits; total time allocation

<table>
<thead>
<tr>
<th>Course Letter/Number</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 254</td>
<td>4</td>
<td>Differential Equations</td>
</tr>
</tbody>
</table>

Lecture/Discussion 4 hrs/semester Lab hrs/semester Clinical hrs/semester

Catalog Description and Pre- and Co-requisites (Same as taxonomy and catalog)
Explore solutions of first order differential equations, linear differential equations with constant coefficients, variation of parameters, series solutions, Laplace transforms, eigenvectors and eigenvalues and application to solution of systems of linear first order equations. Graphing calculator required. The mathematics department recommends that the prerequisite not be more than two years old, then the recommendation is that the course placement exam be taken of the prerequisite be retaken to ensure the success of the student. Prerequisite: MAT 154
Prerequisite: MAT 154 with 2.0 minimum, within 2 years

Knowledge, Skills and Abilities Students Acquire from this Course (Educational Objectives)
1. Solve first-order differential equations that are separable, homogeneous, exact or linear.
2. Solve second-order differential equations with constant coefficient.
3. Find a series solution to a differential equation.
4. Use numerical methods to solve a differential equation.
5. Solve systems of differential equations.
6. Use appropriate technology, including a graphing calculator and computer algebra system.
7. Solve applications problems including harmonic motion, damped motion, electrical circuits, growth and decay.

Associate Degree Outcomes Addressed in this Course (These must appear in course syllabus.)
- ADO 3: Demonstrate computational skills and mathematical reasoning
- ADO 7: Critical Thinking

Units/topics of Instruction
See course description and educational objectives.

Instructional Techniques and Procedures
Although techniques vary from instructor to instructor, this course usually consists of mostly lecture and group work.

Instructional Use of Computer or Other Technology
A graphing calculator and a computer algebra system (CAS) is used extensively in this course.

Instructional Materials and Costs to Students
The instructional material for this course consists of the textbook, CAS, and a graphing calculator.
### Skills and Abilities Students Should Bring to the Course

<table>
<thead>
<tr>
<th>Able to read</th>
<th>Able to compute</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>x</em> a limited amount of material</td>
<td><em>x</em> basic, pre-algebraic problems</td>
</tr>
<tr>
<td>_ _ an average amount of material</td>
<td>_ _ simple algebraic problems</td>
</tr>
<tr>
<td>_ _ an above average amount of material</td>
<td>_ _ higher order mathematical problems</td>
</tr>
<tr>
<td>_ _ relatively easy material</td>
<td>_ _ short compositions</td>
</tr>
<tr>
<td>_ _ moderately difficult material</td>
<td>_ _ medium length compositions</td>
</tr>
<tr>
<td><em>x</em> technical or sophisticated material</td>
<td>_ _ lengthy compositions</td>
</tr>
<tr>
<td>_ _ keyboard skills/familiar with computer</td>
<td>_ _ other necessary abilities</td>
</tr>
<tr>
<td><em>x</em> computer application</td>
<td>_ _</td>
</tr>
<tr>
<td><em>x</em> web navigation</td>
<td>_ _</td>
</tr>
</tbody>
</table>

### The Course is Usually Scheduled

- **Day:**
  - Fall _ _
  - Winter _x_
  - Spring _ _

- **Evening:**
  - Fall _ _
  - Winter _ _
  - Spring _ _

- **Prepared by**
- **Date**

- **Approved by Dept.**
- **Date**

- **Approved by Dean**
- **Date**

- **Approved by Curr. Comm.**
- **Date**

(Last names, please)

*Form Revised 12/4/00*