School of: Arts and Sciences  Prepared by: Mathematics Department  IAI Code: M1900B

Department: Mathematics  Date (prepared for CCC): 5/25/11

Major Curriculum or market served: Science, Engineering and Mathematic

Annual Review Date: Fall

Course Data:

<table>
<thead>
<tr>
<th>Prefix No.</th>
<th>Course Title</th>
<th>Credit</th>
<th>Lecture</th>
<th>Lab</th>
<th>Clinical Lab</th>
<th>*Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 131</td>
<td>Calculus &amp; Analytic Geometry I</td>
<td>5.0</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
<td>None</td>
</tr>
</tbody>
</table>

Prerequisite(s):
Writing: Assessment test score of 4 or higher; an English ACT score of 20 or higher; or a grade of "C" or better in RHT 095 or RHT 096 or completion of RHT 101
AND
Reading: Assessment test score of 4 or higher; a Reading ACT score of 20 or higher; or a grade of "C" or better in RHT 085 or RHT 086 or completion of RHT 101
AND
MAT 111 or MAT 110 and MAT 114 (grades of “C” or better) or qualifying score on the placement test or ACT Math score of 28 (within the last two years).

Catalog Course Description:
First course in a three-part calculus sequence. Introduces the concept of a limit process which is central to much of modern mathematics. Develops the differential and integral calculus of elementary functions from the limit idea. Develops applications to geometry, physics, economics and other sciences.

I. Overall Learning Goals (1 or 2 sentences):
Upon successful completion of this course, the student will be able to:
Comprehend and apply the concepts and problem solving techniques of differential and integral calculus. These concepts will apply to aspects of science, engineering and pre-professional education.

*List course fee amount for new courses only. List ‘None’ if course fee not required.
II. **Resources utilized:**

A. Required textbook(s)/workbook(s) example: (list author, year of publication, *title of work*, location: (i.e. New York, NY), and publisher):


B. Supplementary texts/and materials:

C. Other resources utilized: MyMathLab

(HINT: Double-click on the □ and mark ‘checked’ or ‘not checked’)

III. **Instructional Strategies:** Check and comment as needed on the instructional methods utilized to attain the course objectives:

- Lecture
- Discussion
- Laboratory
- Lecture/Demonstration
- Independent Study
- Clinical Lab
- Internship
- Power Point
- Problem solving/case situations

Other: Graphing Calculator Demonstrations

Comments: instructional methods utilized (optional):

IV. **Formative Evaluation:** Check the evaluation methods utilized to monitor progress toward attainment of course objectives:

- Quizzes
- Laboratory skills
- Presentations
- Examinations
- Oral participation
- Projects
- Journal
- Written assignments
- Clinical progress reports
- Mid-term examination
- Portfolio
- Coop experience Progress report

Other:

V. **Summative Evaluation:** Check the evaluation method utilized to determine whether final course objectives have been attained:

- Final (written) examination
- Course projects
- Final (oral) examination
- Term papers
- Final clinical/laboratory exam
- Portfolio
- Final skills test
- Final coop experience evaluation

Other:

VI. **Assessment:** Check the assessment method(s) utilized to determine if the learning goals and objectives have been attained:

- Pre/post test/paper
- License/certification exam results
- One-minute paper
- Journal assignment
- Portfolio assessments
- Common writing assessment
- Student survey
- Employer survey
- Departmental Final Exam
Course survey for Mat 124, 131, 133, 134, 135 and 341

1. How would you rate your level of preparation coming into this class?
   
   a. Well prepared (I was very proficient in all the math skills required in this course)  
   b. Prepared (I may have had a few weak areas, but I overcame them easily enough)  
   c. Not very well prepared (I had more weaknesses than strengths in my math skills)  

2. Which math skill was your greatest weakness coming into this class?  
   
   a. High School Math background was weak.  
   b. Basic – Intermediate level algebra (this can include functions, factoring, exponents, fractions, etc.)  
   c. Trigonometry  
   d. Calculus I concepts  
   e. Calculus II concepts  
   f. No weakness coming into the class  
   g. Other (please list)  

3. How did you address your weaknesses during this class? Mark all that apply.  
   
   a. Reviewed previous course work/materials  
   b. Got tutoring assistance  
   c. Saw the teacher for help  
   d. Used review materials on MyMathLab  
   e. Did not seek additional assistance  
   f. Other (please list)  

4. How confident are you that you have mastered the skills/concepts of this class?  
   
   a. Very confident  
   b. Confident  
   c. Not very confident  
   d. Not confident at all  

5. How well prepared do you feel the next math course you have to take?  
   
   a. Very well prepared  
   b. Prepared (you may have some weak areas, but can easily overcome them going forward)  
   c. Not well prepared (more weaknesses than strengths at this point)  
   d. Not prepared at all for the next course  
   e. Not applicable – this was my last math class.
6. Are you a math major?  YES  NO

If yes, what kinds of things could the Triton Mathematics Department do to assist you? Circle as many as apply:

  Provide a faculty mentor

  Inform me about summer internships and other activities

  Provide volunteer tutoring opportunities

  Start a math club, I would join

  Provide opportunities to enter math competitions
**VII. Course Plan:** Indicate the distribution of contact hours by topic.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Contact Hours</th>
<th>Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lecture</td>
<td>Laboratory</td>
</tr>
<tr>
<td>Limits</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Continuity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tangent Lines and Rates of Change</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Definition and Polynomial Derivatives</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Product and Quotient Rules (Including Trigonometric Functions)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Extended Power Rule, Chain Rule</td>
<td>3</td>
<td></td>
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<tr>
<td>Implicit Differentiation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Related Rates</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Differentials</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Extrema Theory</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Rolle’s Theorem; Mean-Value Theorem</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Curve Sketching and Other Applications</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Indeterminate forms and L'Hôpital’s Rule</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Antiderivatives</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Newton’s Method (optional)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Indefinite Integral</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Fundamental Theorem of Calculus</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Integration by Substitution</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Numerical Integration</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Areas between curves</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Logarithmic, Exponential, and Other Transcendental Functions</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Derivatives, Integration, and Applications of Logarithmic, Exponential and Other Transcendental Functions</td>
<td>6</td>
<td></td>
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<tr>
<td>---------------------------------------------------------------</td>
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<tr>
<td>Inverse Functions</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hyperbolic Functions</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Inverse Trigonometric Functions</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Hours for Review and Testing</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>75</strong></td>
<td></td>
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</tbody>
</table>

VIII. **Learning Objectives:** For courses approved by ICCB, it is presumed students will spend a minimum of 2 hours outside study for each 1 hour of lecture in class; and a minimum of 1 hour of outside study for each 2 hours of lab or clinical in class, in order to meet the following objectives. Attach additional pages as needed. (Learning objectives must be stated in measurable terms)

<table>
<thead>
<tr>
<th>Objective</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>Clinical/Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop an understanding of the concepts and the theory of limit, continuity, derivative, anti-derivative and definite integral.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Acquire computational facility in finding derivatives and anti-derivatives.</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Learn to apply these concepts and techniques to a variety of problems in geometry, physics, economics and other sciences.</td>
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<td>X</td>
<td></td>
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<tr>
<td>Acquire a deeper understanding of the uses of mathematics and how to translate applied problems into mathematical language.</td>
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<td>X</td>
<td></td>
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<tr>
<td>Develop an enlarged understanding of what constitutes a mathematical proof and appreciate the need for precise language and notation.</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Increase the ability to read and interpret mathematical material.</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Memorize all formulas.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>