### Course Outline – Seattle Central Community College

<table>
<thead>
<tr>
<th>Course Prefix &amp; No.:</th>
<th>MATH&amp; 152</th>
<th>Title:</th>
<th>Calculus II</th>
<th>Credits:</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Division:</td>
<td>Science &amp; Math</td>
<td>Program/Department:</td>
<td>Mathematics</td>
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<td>Max Class Size:</td>
<td>32</td>
<td>Course length:</td>
<td>11 weeks</td>
<td>Prerequisite(s):</td>
<td>In last 3 years: MATH&amp; 151 with 2.0 or Placement Test Score.</td>
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<td>Total Contact Hours:</td>
<td>55</td>
<td>Lecture:</td>
<td>55 (11 h. = 1 cr.)</td>
<td>Mode(s) of Delivery:</td>
<td>On campus self-contained</td>
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<td>Lab:</td>
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<td>Correspondence</td>
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<td></td>
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<td>Clinical:</td>
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<td>Televise</td>
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<td>Other:</td>
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<td>Online instruction</td>
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<td></td>
<td></td>
<td>(unsupervised; 33 hrs. = 1 cr.)</td>
<td>Hybrid (e.g., online and on campus)</td>
<td>Other (please describe):</td>
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<tr>
<td>Course Description</td>
<td>This course introduces students to the use of integral calculus by emphasizing the modeling approach throughout. Students are expected to understand indefinite and definite integrals beyond the purely symbolic level. Concepts are presented using the Rule of 3 (numerical, graphical, and algebraic representations). The appropriate use of technology (graphing calculators and a symbolic algebra system) is required.</td>
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<td>Learning Outcomes</td>
<td>As a result of taking this course, students will be able to:</td>
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<td>• Evaluate definite integrals using Riemann sums and the fundamental theorem of calculus, and interpret the results.</td>
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<td>• Evaluate indefinite integrals using basic anti-derivative formulas, substitution, and parts.</td>
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<td>• Compute numerical estimates for definite integrals.</td>
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<td>• Evaluate improper integrals.</td>
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<td>• Determine the area between two curves by integrating in the x- or y-direction.</td>
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<td>• Compute the volume of a surface of revolution or other solid object.</td>
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<td>• Find the length of a curve expressed in function or parametric form.</td>
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<td>• Determine the average value of a function, and interpret its meaning.</td>
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<td>• Solve application problems involving the physics concept of work.</td>
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<td>• Solve application problems about surface area, fluid pressure, center of mass, and probability (as time allows).</td>
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<td>• Sketch and interpret slope fields for simple differential equations.</td>
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<td>• Solve differential equations using Euler’s method and separation of variables.</td>
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<td>• Determine Taylor polynomials and Taylor series for a variety of functions.</td>
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<td>Program/Degree Outcomes</td>
<td>This course addresses the following program or degree outcomes:</td>
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<td>• Develop and use skills in critical thinking, quantitative analysis</td>
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<td>• Develop and use skills for in-person interactions with individuals and within groups.</td>
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<td>• Use methods and modes of inquiry specific to mathematics</td>
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Last Update: 8/14/14
- Demonstrate effective oral and written communication, teamwork and collaboration in mathematical settings
- Demonstrate academic honesty and ethical behavior

<table>
<thead>
<tr>
<th>Topical Outline and/or Major Divisions</th>
<th>This course covers the following topics:</th>
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<tr>
<td></td>
<td>- Evaluating definite integrals using Riemann sums and the fundamental theorem of calculus.</td>
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<td>- Interpreting definite integrals in terms of area and as net change.</td>
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<td>- Evaluating indefinite integrals using substitution and parts.</td>
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<td>- Numerical approximation methods for definite integrals.</td>
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<td>- Evaluating improper integrals.</td>
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<td></td>
<td>- Applications of integration: areas, volumes, arc length, average value, and work.</td>
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<td>- Differential equations: slope fields, Euler's method, separation of variables, and applications.</td>
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<td>- Taylor polynomials and Taylor series.</td>
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<tr>
<th>Distribution Area</th>
<th>Natural World</th>
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<tr>
<td>Additional Information</td>
<td>Students are expected to be proficient with a computer algebra system before beginning the course; if not, they should enroll concurrently in CSC102Q: Computers in Mathematics.</td>
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<tr>
<th>CAC Use Only Special Designation (s)</th>
<th>QSR</th>
<th>IS</th>
<th>C</th>
<th>GS</th>
<th>US</th>
<th>None</th>
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</thead>
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| Outline Prepared by: | Greg Langkamp | Date: | April 25, 2011 |