# Syllabus for SM122 - Calculus II

**Spring Semester, 2014-2015**

**TEXT:** *CALCULUS, Early Transcendentals*, Seventh Edition, by James Stewart

<table>
<thead>
<tr>
<th>Lesson</th>
<th>w/Tue</th>
<th>w/Th</th>
<th>Section</th>
<th>TOPIC</th>
<th>PROBLEMS</th>
</tr>
</thead>
</table>
| 1      | 1/7   | 1/7  | 5.2, 5.3  | Review: Riemann Integral, Fund Thm of Calc | p.382: 3, 34, 37, 48  
                             |                   |                                      | p.394: 3, 8, 12    |
| 2      | 1/9   | 1/8  | 5.3       | Review Fund Thm of Calc                   | p.394: 5, 19,23,25,29,31,41,46,63     |
| 3      | 1/12  | 1/9  | 5.5       | The Substitution Rule                     | p.413: 3,5,7,9,11,15,21,23,26,32       |
| 4      | 1/13  | 1/12 | 5.5       | The Substitution Rule                     | p.414: 30,33,45,53,56,57,60,64,81,85   |
| 5      | 1/14  | 1/14 | 6.1       | Areas between Curves                      | p.427: 3,8,12,17,23,26,44,47           |
| 6      | 1/16  | 1/15 | 6.2       | Volumes                                   | p.438: 1,4,5,12,15,44,49               |
| 7      | 1/20  | 1/16 | 6.4       | Work                                      | p.449: 3,5,6,7,8,10,11                 |
| 8      | 1/21  | 1/20 | 6.4       | Work                                      | p.450: 13,15,19,20,21,22               |
| 9      | 1/23  | 1/21 | 6.5       | Average value of a Function               | p.453: 3,9,10,15,16, PROOF: Problem 25 |
| 10     | 1/26  | 1/22 | 8.3       | Hydrostatic Force                         | p.560: 1,3,5,7                         |
| 11     | 1/27  | 1/23 | 7.7       | Approximate Integration                   | p.516: 1,5,11,30,40 (no error bounds)  |
| 12     | 1/28  | 1/26 | Review    |                                            |                             |
| 13     | 1/30  | 1/28 | Review    |                                            |                             |
| 14     | 2/2   | 1/29 | Review    |                                            |                             |
| 15     | 2/3   | 1/30 | 7.1       | Integration by Parts                      | p.468: 1,2,5,9,11,12,15,19 PROOF: Equation 1 |
| 16     | 2/4   | 2/2  | 7.1       | Integration by Parts                      | p.468: 24,26,27,29,37,49,52,69         |
| 17     | 2/6   | 2/4  | 7.4       | Partial Fractions                         | p.492: 3,9,12,14,18                   |
| 18     | 2/9   | 2/5  | 7.4       | Partial Fractions                         | p.493: 23,24,27                       |
| 19     | 2/10  | 2/6  | 7.8       | Improper integrals                        | p.527: 1,5,7,9,13,16,28,31,63,79      |
| 20     | 2/11  | 2/9  | 9.1       | Modeling with Diff Eqns                   | p.584: 3,4,5,7,9,10,14,15              |
| 21     | 2/13  | 2/11 | 9.2       | Direction Fields                          | p.592: 1,3,4,5,6,7,8,9,11              |
| 22     | 2/17  | 2/12 | 9.2       | Euler's Method                            | p.593: 20,21,23,27,28                  |
| 23     | 2/18  | 2/13 | 9.3       | Separable Diff Eqns                       | p.600: 3,4,10,11,19,20,39              |
| 24     | 2/20  | 2/18 | 9.3, 3.8  | Separable Diff Eqns, Exponential growth/decay | p.601: 38;  
                             |                   |                                      | p.243: 5,10,11,16,17                   |
| 25     | 2/23  | 2/19 | Notes 4   | DC Electric Circuits (see note 4 below)   | Setting up ODE and verifying solution : 3,4  
                             |                   |                                      | Solving ODE: 1a,b,e, 3a,b,e             |
| 26     | 2/24  | 2/20 | Review    |                                            |                             |
| 27     | 2/25  | 2/23 | Review    |                                            |                             |
| 28     | 2/27  | 2/25 | Test 2    |                                            |                             |
| 29     | 3/2   | 2/26 | 10.3      | Polar Coordinates                         | p.662: 3,5,7,9,15,17,18,22,25,27,28    |
| 30     | 3/3   | 2/27 | 10.3      | Polar coordinates                         | p.662: 29,31,35,37,47                 |
| 31     | 3/4   | 3/2  | 10.4      | Areas in Polar Coordinates                | p.662: 25,6,7,9,19,23,24              |
| 32     | 3/6   | 3/4  | 11.1      | Sequences                                 | p.700: 3,7,13,14,23,24,25,27,28,30,32  |
| 36     | 3/13  | 3/11 | 11.6      | Ratio test                                | p.737: 1,3,8,9,29,35,37                |
| 37     | 3/23  | 3/12 | 11.8      | Power Series                              | p.745: 3,7,9,14,15,18,23,30,35,42 (rad of conv only) |
| 38     | 3/24  | 3/13 | 11.9      | Functions as Power Series                 | p.751: 3,6,7,13,14,29,31,34,37         |
| 41     | 3/30  | 3/26 | 11.11     | Taylor Polynomials                        | p.774: 1,5,7,9,27,29,31                |
| 42     | 3/31  | 3/27 | Review    |                                            |                             |
### Course Coordinator: Prof Geoffrey Price, glp@usna.edu

**NOTES:**

1. Students should self-enroll in WebAssign using a class key provided by the instructor. **Boldface** problems in this syllabus are not available in WebAssign.


3. Three proofs are assigned in the syllabus. At least one of them will be asked for on the final exam.

4. Notes on electric circuits may be found at [http://www.usna.edu/MathDept/resources/circuits.php](http://www.usna.edu/MathDept/resources/circuits.php). Only the introduction and the material on DC circuits from the sections “Exploring R-L and R-C Circuits” and “Analyzing R-L and R-C Circuits” are to be covered. The two problem sets are at the bottom of the web-page.

5. If you would like help in the course, you should contact your instructor for extra-instruction. If your instructor is not available, try the **Math Lab** in CH130. It is staffed all six class periods every class day with instructors who should be able to answer your questions. Also see the Midshipmen Group Study Program (MGSP) for group study in the evening led by upper classmen.

6. Exercises that ask for verbal explanations should be answered with complete sentences.

7. All students in this course are expected to have the TI-Nspire CX CAS calculator with the capability of doing symbolic calculations. There will be assignments that use such a calculator as well as questions on the common final exam on which it is expected that the student has such a calculator. There will also be problems for which no calculator is allowed. An on line handbook for the calculator is available at: [http://education.ti.com/calculators/downloads/](http://education.ti.com/calculators/downloads/).

8. Classes on Wednesday, 7 January will follow a Monday schedule. The last day of classes is Wednesday 29 April. There’s a Review & Study day scheduled for Thursday 30 April. There are 59 class days in the MTWF and 60 in the MWRF schedule. The Final Exam period is 1 May – 8 May.

9. There will be a “gateway” quiz on Integration. For samples and explanation see: [http://www.usna.edu/MathDept/resources/course-materials.php](http://www.usna.edu/MathDept/resources/course-materials.php).

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Test/Review</th>
<th>Sections</th>
<th>Problems</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>4/1</td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>4/3</td>
<td>Test 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>4/6</td>
<td>12.1</td>
<td>3-D Coordinates</td>
<td>p.790:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,5,7,11,13,15,17,27,31,33,37</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>4/7</td>
<td>12.2</td>
<td>Vectors</td>
<td>p.798:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,5,10,13,17,20,21,23,25,26</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>4/8</td>
<td>12.2</td>
<td>Vectors</td>
<td>p.799:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29,31,32,33,34,37,41</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>4/10</td>
<td>12.3</td>
<td>The Dot Product</td>
<td>p.806:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,3,5,9,11,14,15,20</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>4/13</td>
<td>12.3</td>
<td>The Dot Product</td>
<td>p.806:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23,39,41,43,46,50,51,57</td>
<td><strong>PROOF:</strong> Problem 45</td>
</tr>
<tr>
<td>50</td>
<td>4/14</td>
<td>12.4</td>
<td>The Cross Product</td>
<td>p.814:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,9,15,16,17,19</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>4/15</td>
<td>12.4</td>
<td>The Cross Product</td>
<td>p.814:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13,27,29,39,40,45</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>4/17</td>
<td>12.5</td>
<td>Lines and Planes</td>
<td>p.824:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,3,4,7,11,15,18</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>4/20</td>
<td>12.5</td>
<td>Lines and Planes</td>
<td>p.824:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5,24,27,31,33,41,51,73,75</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>4/21</td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>4/22</td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>4/24</td>
<td>Test 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>4/27</td>
<td>Course Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>4/28</td>
<td>Course Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>4/29</td>
<td>Course Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>4/29</td>
<td>Course Review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>