This course satisfies the Mathematical and Quantitative Reasoning (MQR) requirement of the Pathways General Education Required Core. Below is the Learning Outcomes that all MQR courses satisfy:

<table>
<thead>
<tr>
<th>MQR 1: Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.</th>
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</thead>
<tbody>
<tr>
<td>MQR 2: Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.</td>
</tr>
<tr>
<td>MQR 3: Represent quantitative problems expressed in natural language in a suitable mathematical format.</td>
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<tr>
<td>MQR 4: Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.</td>
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<tr>
<td>MQR 5: Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.</td>
</tr>
<tr>
<td>MQR 6: Apply mathematical methods to problems in other fields of study.</td>
</tr>
</tbody>
</table>
Chapter 9  
9.1  Parametric Curves  
9.2  Calculus with Parametric Curves  
9.3  Polar coordinates  
9.4  Areas and Lengths in Polar Coordinates  

(3 classes)

Chapter 10  
10.1  3-Dimensional Coordinates  
10.2  Vectors  
10.3  Dot Product  
10.4  Cross product  
10.5  Equations of Lines and Planes  
10.6  Cylinders and Quadric Surfaces  
10.7  Vector functions and space curves  
10.8  Arc length & curvature  
10.9  Motion in Space  

(7 classes)

Chapter 11  
11.1  Functions of Several variables  
11.2  Limits & Continuity  
11.3  Partial derivatives  
11.4  Tangent Planes and Linear Approximation  
11.5  Chain Rule  
11.6  Directional Derivatives and the gradient vector  
11.7  Max and Min Values  
11.8  Lagrange Multipliers  

(7 classes)

Chapter 12  
12.1  Double Integrals over rectangles  
12.2  Double Integrals over general regions  
12.3  Double Integrals in Polar Coordinates  
12.4  Applications  
12.5  Triple Integrals  
12.6  Triple Integrals in Cylindrical Coordinates  
12.7  Triple Integrals in Spherical Coordinates  

(7 classes)
**Textbook**

The physical bookstore at Queens College has closed and been replaced with an on-line service here: [http://qc.textbookx.com/institutional/index.php](http://qc.textbookx.com/institutional/index.php) This site sells textbooks without the WebAssign HMS.

The publisher of our textbook (Cengage) offers sales direct to students here [https://www.cengage.com/c/essential-calculus-2e-stewart/9781133112297PF/](https://www.cengage.com/c/essential-calculus-2e-stewart/9781133112297PF/) (reportedly more affordable.)

**HMS Guidelines**


In addition to online homework, the web site offers an e-book version of our text, a personal study guide for students, and videos of lectures linked to each section of the book. All students self-enroll in WebAssign.

If you are using WebAssign for on-line homework you will need to create a Course in your account for your section. Once you create this section the system will give you a class key, which your students will use to enroll in your section. Later you can find this code in Class View by clicking on “class key settings” in the Class Tools menu.

To create your section: Choose “Create” in the top left menu below “Home”, then “Course”, and select the textbook. Click “enable personal study plan” and the textbook certification. Once you set the start date of the course, students have a 2-week grace period after that date during which they can log in without having paid for access. After you save the course settings, set “How will students be placed on your roster” to self-enrollment.