

## MAT211– Calculus III (Fall 2024) Course Syllabus

### Instructor

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Student Consultation Hours: 10-11 am on MW and 12:30 – 2 pm on TR

Office: MCT278



| Face-to-Face Meet    | Online Component   |
|----------------------|--|
| 9-10am MWF at DHC104 | Tuesday Asynchronous in d2l<br>(watch videos & make notes) |

### Important Sites

D2L <https://d2l.ship.edu>

Zoom Office Hours <https://ship.zoom.us/j/94338091000>

### Course Materials

D2L provides links to videos, notes, and homework. You will submit your class activities to this site and you can check your grades.

**Text Book (optional):** OpenStax Calculus Volume III (<https://openstax.org/details/books/calculus-volume-3>)

**Calculator:** TI-83/84 will be allowed.

### Course Description

This course covers multi-variable functions and their graphical representations; vectors and calculus of vector valued functions; partial derivatives and gradients; optimization; multiple integrations; polar coordinate systems; curves; vector fields; line integrals; Green's theorem.

*Prerequisite: Grade of C or better in MATH212.*

If you feel you're in the wrong course, please contact the Mathematics Department secretary ([math@ship.edu](mailto:math@ship.edu)) as soon as possible. **Your schedule can be changed only during the first week of class.**

### Student Learning Objectives

Upon successful completion of this course, you will:

- Develop an understanding of core concepts in post-secondary mathematics (SLO 2A)
- Develop proficiency to use mathematics-specific technology as a problem-solving tool (SLO 4A)
- Analyze and express three-dimensional curves with vector equation, parametric equations, polar coordinates, and multivariate functions
- Analyze and compute the limit of a multivariate function and understand the application of limits to the concept of continuity and slope

- Differentiate multivariate functions to find gradient and optima
- Compute double, triple, and line integrals and utilize them for physics applications

### Tentative Schedule

**Exam 1:** Friday of September 27

**Exam 2:** Wednesday of November 6

**Online Quiz:** Tuesday of November 26(You will not have an extension)

**Final:** To be announced (it will be on the final week, and cumulative)

### Tutoring

Free, drop-in or appointment-required Learning Center Tutoring at Mowrey

### Grading

Your grade will be based on your notes, homework, quizzes, and a cumulative Final. I will use the following grading scheme:

|                         |            |  |
|-------------------------|------------|--|
| <b>Class Activities</b> | <b>10%</b> | Attendance +Note Submission+ Quizzes             |
| <b>Homework</b>         | <b>20%</b> | MOM work on line                                 |
| <b>Exams</b>            | <b>70%</b> | Exam1, 2, & Final (each 30%) + Online Quiz (10%) |

At the end of the course, I will assign grades based on the following scale:

|             |         |       |       |       |       |       |       |       |      |
|-------------|---------|-------|-------|-------|-------|-------|-------|-------|------|
| Percentage  | 90 -100 | 87-89 | 84-86 | 80-83 | 77-79 | 74-76 | 70-73 | 60-69 | 0-59 |
| Final Grade | A       | A-    | B+    | B     | B-    | C+    | C     | D     | F    |

### Expectations

**In each face-to-face class**, you will receive notes with many blanks that you are supposed to fill in during each class time period. **In each asynchronous online class**, you will watch video, take notes, and **submit 1 pdf file for your class activities to d2l**, unless you are asked not to. (I recommend Adobe Scan or Genius Scan app to take a picture of your work, save it as one single pdf file, and then upload it in d2l. The instruction is available below.)

**If you miss any class**, please find **study materials (book, notes, videos) in d2l and contact me** immediately if you need any additional assistance.

**Homework:** You will see homework links in d2l. **You can redo homework** assignments as many times as you want **before the deadline**.

### Scan App Information

#### Adobe Scan app

- Android link: [https://play.google.com/store/apps/details?id=com.adobe.scan.android&hl=en\\_US](https://play.google.com/store/apps/details?id=com.adobe.scan.android&hl=en_US)
- Apple link: <https://apps.apple.com/us/app/adobe-scan-digital-pdf-scanner/id1199564834>
- Video tutorial: <https://www.youtube.com/watch?v=MCyhOkBpELc>

#### Genius Scan app

- Android  
link:[https://play.google.com/store/apps/details?id=com.thegrizzlylabs.geniusscan.free&hl=en\\_US](https://play.google.com/store/apps/details?id=com.thegrizzlylabs.geniusscan.free&hl=en_US)
- Apple link: <https://apps.apple.com/us/app/genius-scan-pdf-scanner/id377672876>
- Video tutorial: <https://www.youtube.com/watch?v=PAmUKvvUjgs>

## Tentative Course Calendar (Fall 2024)

Adjustments and updates to the course schedule, due to inclement weather or other unforeseen events, will be announced in class.

| Week                    | Section and Topic                                 | STUDENT LEARNING OBJECTIVES - TSWBT (the student will be able to):  | Assignments   |
|-------------------------|---|---|---|
| <b>1</b><br>8/26-30     | M (Review)<br>TA(Review)<br>W (1.1)<br>F(1.2)     | <ul style="list-style-type: none"> <li>Review derivative and integral formulas and rules</li> <li>More Review</li> <li>Plot the parametric equations and convert the parametric equations to <math>y = f(x)</math></li> <li>Differentiate and Integrate parametric equations</li> </ul>   | <b>Weekly HW in d2l</b><br><b>Note Submission1</b>        |
| <b>2</b><br>9/2-6       | M(No class)<br>TA(2.1)<br>W(2.2)<br>F(2.3)        | <ul style="list-style-type: none"> <li>Describe vectors and notation, perform basic operation, find magnitude and unit vector, and express vectors in terms of standard unit vectors</li> <li>Extend the vectors and basic graphing ideas in two dimensions to three dimensions</li> <li>Calculate the dot product and the vector projection</li> </ul>   | <b>Note Submission2</b>                                   |
| <b>3</b><br>9/9-13      | M(2.4)<br>TA(2.5a)<br>W(2.5b)<br>F(2.6)           | <ul style="list-style-type: none"> <li>Calculate the cross product and the area/volumes using the cross product</li> <li>Find parametric/symmetric equations and the distance from a point for a line.</li> <li>Find vector/scalar equations for a plane, the distance between a point and a plane, and the angle between planes.</li> <li>Identify quadratic surfaces and draw them using traces.</li> </ul>     | <b>Note Submission3</b>                                   |
| <b>4</b><br>9/16-20     | M (3.1)<br>TA(3.2a)<br>W(3.2b)<br>F(3.3)          | <ul style="list-style-type: none"> <li>Graph vector-valued functions including a helix and find limits.</li> <li>Differentiate vector-valued functions and find the (unit) tangent vector</li> <li>Find the (in)definite integral of a vector-valued function</li> <li>Find the arc length and arc length function for a vector-valued function</li> </ul>  | <b>Note Submission4</b>                                   |
| <b>5</b><br>9/23-27     | M(3.4)<br>TA(Review)<br>W(Review)<br>F(Exam)      | <ul style="list-style-type: none"> <li>Find the velocity, acceleration, and speed of motion in space and tangential and normal components of acceleration</li> </ul>  | <b>No Note Submission</b><br><b>Exam on Friday 9/27</b>   |
| <b>6</b><br>9/30-10/4   | M(4.1)<br>TA(4.2)<br>W(4.3)<br>F(4.4a)            | <ul style="list-style-type: none"> <li>Find the domain, range, graph, and a contour of the two variable functions</li> <li>Calculate the limit of two or more variable functions and state the continuity</li> <li>Find the partial derivatives of two or more variable functions</li> <li>Find an equation for a tangent plane and a linear approximation using it</li> </ul>                                    | <b>Note Submission6</b>                                   |
| <b>7</b><br>10/7-11     | M(4.4b)<br>TA(4.5)<br>W(4.6a)<br>FA(4.6b)         | <ul style="list-style-type: none"> <li>Determine differentiability for a two variable function and use the total differential to estimate the change in a two variable function</li> <li>Apply chain rule to find derivatives of composition of multi variable functions</li> <li>Find directional derivatives of two variable functions</li> <li>Find gradients and draw gradients and tangent vector</li> </ul> | <b>Note Submission7</b><br><b>Note Submission7.2</b>      |
| <b>8</b><br>10/14-18    | M(No class)<br>TA(No class)<br>W(4.7a)<br>F(4.7b) | <ul style="list-style-type: none"> <li>Find critical points and local extrema for two variable functions</li> <li>Find global extrema for two variable functions</li> </ul>   | <b>No Note Submission</b>                                 |
| <b>9</b><br>10/21-25    | M (5.1a)<br>TA (5.1b)<br>W(5.2a)<br>F(5.2b)       | <ul style="list-style-type: none"> <li>Evaluate a double integral over a rectangular region</li> <li>Calculate double integrals to find a volume under a surface</li> <li>Evaluate a double integral over a general region</li> <li>Calculate more double integrals.</li> </ul>   | <b>Note Submission9</b>                                   |
| <b>10</b><br>10/28-11/1 | M(1.3)<br>TA(5.3a)<br>W(5.3b)<br>F(5.4a)          | <ul style="list-style-type: none"> <li>Convert points between rectangular and polar coordinates and sketch polar curves</li> <li>Evaluate a double integral in polar coordinates</li> <li>Calculate more double integrals in polar coordinates for volume and area</li> <li>Evaluate triple integrals</li> </ul>  | <b>Note Submission10</b>                                  |
| <b>11</b><br>11/4-8     | M(Review)<br>TA(Review)<br>W(Exam)<br>FA(5.4b)    | <ul style="list-style-type: none"> <li>Change orders of triple integrals</li> </ul>   | <b>Exam on Wednesday 11/6</b><br><b>Note Submission11</b> |
| <b>12</b><br>11/11-15   | M(6.1a)<br>TA(6.1b)<br>W(6.2a)<br>F(6.2b)         | <ul style="list-style-type: none"> <li>Sketch vector fields</li> <li>Plot gradient fields and identify conservative vector field</li> <li>Calculate a scalar line integral</li> <li>Calculate a vector line integral and compute work</li> </ul>  | <b>Note Submission12</b>                                  |

|                       |   |   |  |
|-----------------------|---|---|--|
| <b>13</b><br>11/18-22 | M(6.2c)<br>TA(6.3a)<br>W(6.3b)<br>F(6.4a)         | <ul style="list-style-type: none"> <li>• Calculate flux and circulation</li> <li>• Use the Fundamental theorem for line integrals to evaluate a line integral in a vector field and find a potential function for a conservative vector field.</li> <li>• Determine if a vector field is conservative and apply the FTLI.</li> <li>• Apply the circulation form of Green's theorem</li> </ul> | <b>Note Submission13</b>                                   |
| <b>14</b><br>11/25-29 | M(6.4b)<br>TA(Quiz)<br>W(No class)<br>F(No class) | <ul style="list-style-type: none"> <li>• Apply the flux form of Green's theorem</li> </ul>  | <b>Online Quiz on Tuesday</b><br><b>No Note Submission</b> |
| <b>15</b><br>12/2-6   | M(Review)<br>TA(Review)<br>W(Review)<br>F(Review) | <ul style="list-style-type: none"> <li>• Review for the final</li> </ul>  | <b>No Note Submission</b>                                  |
| <b>16</b><br>12/9-13  | Final   | <ul style="list-style-type: none"> <li>• Final exam is a cumulative exam. The date will be announced later.</li> </ul>  | <b>Final Exam</b>  |

## Title IX Reporting Requirements

Shippensburg University of Pennsylvania and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the university's commitment to offering supportive measures in accordance with the regulations issued under Title IX, Shippensburg University of Pennsylvania requires faculty members to report incidents of sexual violence shared by students to the university's Title IX Coordinator, Dr. John Burnett [JABurnett@ship.edu] or [Title9@ship.edu]. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a university-approved research project. **Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the university' Protection and Supervision of Minors on Campus Policy.**

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence are available on the Office of Human Resources website:

[https://www.ship.edu/about/offices/hr/title\\_ix\\_statement/](https://www.ship.edu/about/offices/hr/title_ix_statement/)

Reports may be made to the following individuals:

Dr. John Burnett  
Title IX Coordinator  
Office of Human Resources  
Old Main 106-A  
Shippensburg, PA 17257  
771-477-1323  
Cell: 724-317-6415  
Email: [JABurnett@ship.edu](mailto:JABurnett@ship.edu)

Nipa Browder  
Deputy Title IX Coordinator  
Office of Human Resources  
Ph: 717-477-1124  
Email: [Nbrowder@ship.edu](mailto:Nbrowder@ship.edu)

Jennifer Milburn  
Deputy Title IX Coordinator  
Housing/ResLife/Conferences  
Ph: 717-477-1904  
Email: [JSMilburn@ship.edu](mailto:JSMilburn@ship.edu)

Trejon Dinkins  
Deputy Title IX Coordinator  
Retention and Student Success  
Ph: 717-477-1123 x3027  
Email: [TADinkins@ship.edu](mailto:TADinkins@ship.edu)

Alix Rouby  
Deputy Title IX Coordinator  
Career Center  
Ph: 717-477-1595  
Email: [AJRouby@ship.edu](mailto:AJRouby@ship.edu)

Mary Burnett  
Deputy Title IX Coordinator  
International Programs  
Ph: 717-477-1279  
Email: [MEBurnett@ship.edu](mailto:MEBurnett@ship.edu)

Link for the online reporting form: (This is for reporting an issue, not making a formal complaint)

[https://cm.maxient.com/reportingform.php?ShippensburgUniv&layout\\_id=3](https://cm.maxient.com/reportingform.php?ShippensburgUniv&layout_id=3)

Link for the Formal Complaint form:

[https://cm.maxient.com/reportingform.php?ShippensburgUniv&layout\\_id=21](https://cm.maxient.com/reportingform.php?ShippensburgUniv&layout_id=21)

Link for campus resources:

[https://www.ship.edu/about/offices/hr/title\\_ix\\_statement/resources/](https://www.ship.edu/about/offices/hr/title_ix_statement/resources/)