#### College of Staten Island, City University of New York (CUNY)

## Math 232 (Section 35975): Fall 2021 Syllabus

#### Analytic Geometry and Calculus II

#### Instructor: Joseph Maher

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Office hours: M 12:20-2:15, W 1:25-2:15

Course location: MW 10:10-12:05, 1S-116

Textbook: Rogawski, *Calculus, Early Transcendentals*, ET edition, W.H. Freeman ISBN:

Grading policy: 10% Homework and attendance

50% Midterms

40% Final

#### Additional info:

- Disability policy: Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office for Disability Services. Prior to granting disability accommodations in this course, the instructor must receive written verification of student's eligibility from the Office of Disability Services, which is located in 1P-101. It is the student's responsibility to initiate contact with the Office for Disability Services staff and to follow the established procedures for having the accommodation notice sent to the instructor.
- Integrity policy: CUNY's Academic Integrity Policy is available online at http://www.cuny.edu/about/info/policies/academic-integrity.pdf

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# THE COLLEGE OF STATEN ISLAND, CUNY DEPARTMENT OF MATHEMATICS

## MATH 232 – CALCULUS II COURSE OUTLINE

- Text: Rogawski, Adams & Franzosa, <u>Calculus Early Transcendentals</u>, 4th Edition.
  W. H. Freeman & Co. (2019).
  ISBN: 9781319411671 (e-book ISBN: 9781319411657)
- Note: Below, each lesson corresponds to a one-hour class. Homework problems in **bold** correspond to similar WeBWorK problems, which must be submitted online. Students are also required to complete five MATLAB projects listed below, which can be obtained in PDF at www.lulu.com with search term "csi math".

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| Lesson | Section    | Торіс   | Homework Problems  |
|--------|------------|---|--|
| 1      | 5.2<br>5.3 | Review: Definite integral<br>Review: Indefinite integral          | 8,9,13,18,22,25,31,43,47,58<br>3,5,7,14,16,17,19,22,24,27,32,38,47,51,66   |
| 2      | 5.4<br>5.5 | Review: Fundamental Thm Calc I<br>Review: Fundamental Thm Calc II | <b>10,11,13</b> ,25, <b>33,</b> 35,37,40, <b>45,47,53</b> ,55,62<br><b>14,15,19,21,22,25,27,28,33,34,37</b> ,39,41,43,47 |
| 3      | 5.7        | Review: Integration by substitution                               | 29, 30, 35, 38, 48, 53, 63, 67, 73, 87, 97   |
| 4      | 5.7<br>5.8 | Review: Further integral formulas                                 | <b>3, 9,</b> 17, 20, <b>47, 48, 50,</b> 57<br>MATLAB 1: Intro to Symbolic Math   |
| 5      | 6.1        | Area between two curves   | 1, <b>3</b> , 4, 7, 8, <b>9</b> , 11, 17, <b>20, 29, 36</b>  |
| 6      | 6.1        | Area between two curves   |  |
| 7      | 6.2        | Volume, Average value   | <b>1</b> , <b>5</b> , <b>8</b> , <b>9</b> , <b>11</b> , <b>13</b> , 14, <b>26</b> , 37, 39, <b>45</b> , 60               |
| 8      | 6.2        | Volume, Average value   |  |
| 9      | 6.3        | Volume of revolution  | 1, 3, <b>5</b> , <b>7</b> , <b>9</b> , <b>11</b> , <b>25</b>   |
| 10     | 6.3        | Volume of revolution  | MATLAB 2: Applications of Integration  |
| 11     | 6.4        | Cylindrical shells  | 1, 5, <b>11</b> , <b>17</b> , <b>19</b> , <b>22</b> , <b>26</b> , <b>28</b>  |
| 12     | 6.4        | Cylindrical shells  |  |
| 13     | 7.1        | Integration by parts  | <b>3</b> , 4, <b>5</b> , 7, <b>11</b> , <b>13</b> , <b>16</b> , 18, 25, <b>49</b> , <b>52</b>                            |
| 14     | 7.1        | Integration by parts  |  |
| 15     | 7.2        | Trigonometric integrals   | 1, 3, 5, 9, <b>14, 18,</b> 19, <b>26</b>   |

| 16 | 7.3  | Trigonometric substitution                                     | 1, 3, <b>5</b> , 13, <b>15</b> , <b>17, 19</b> , <b>24</b>  |  |
|----|------|--|---|--|
| 17 | 7.3  | Trigonometric substitution                                     |   |  |
| 18 | 7.5  | Partial fractions  | <b>1</b> , <b>9</b> , <b>10</b> , 12, <b>14</b> , 17, <b>22</b> , 31, <b>40</b> , 52                                |  |
| 19 | 7.5  | Partial fractions  | MATLAB 3: Integration   |  |
| 20 | 7.6  | Strategies for integration                                     | 24, 33, 40, 44, 47, 59  |  |
| 21 |      | Review   |   |  |
| 22 |      | Exam 1   |   |  |
| 23 |      | Exam 1   |   |  |
| 24 | 77   | Improper integrals   | 12 15 21 27 30 48 53 54 65 66 76  |  |
| 25 | 7.7  | Improper integrals   |   |  |
| 20 | 10.1 |  |   |  |
| 20 | 10.1 | Sequences      13, 21, 23, 30, 31, 61, 62, 65, 66, 67          |   |  |
| 27 | 10.1 | Sequences  | 0 44 04 07 00 00 00 40 50 55  |  |
| 28 | 10.2 | Series   | 9, 11, 24, 27, 28, 30, 32, 48, 52, 55   |  |
| 29 | 10.2 | Series   |   |  |
| 30 | 10.3 | f positive series  | <b>3</b> , <b>5</b> , <b>7</b> , <b>10</b> , <b>12</b> , 18, <b>19</b> , <b>23</b> , <b>38</b> , 45, <b>49</b> , 55 |  |
| 31 | 10.3 | Convergence of positive seConvergence ories                    |   |  |
| 32 | 10.4 | Absolute and conditional convergence 3, 8, 10, 13, 15, 19, 24  |   |  |
| 33 | 10.4 | Absolute and conditional convergence                           |   |  |
| 34 | 10.5 | Ratio and root tests 5, 7, 11, 15, 23, 37, 39, 40, 41, 47, 49, |   |  |
| 35 | 10.5 | Ratio and root tests   |   |  |
| 36 | 10.6 | Power series   | 1, 7, 11, <b>13</b> , <b>20</b> , <b>23</b> , 24, 27, <b>31</b> , <b>40</b>   |  |
| 37 | 10.6 | Power series   |   |  |
| 38 | 10.7 | Taylor polynomials      1, 3, 9, 11, 16, 19, 31                |   |  |
| 39 | 10.7 | Taylor polynomials   | MATLAB 4: Taylor Polynomials  |  |
| 40 | 10.8 | Taylor series  | 4, 5, 9, 12, 34, 39   |  |
| 41 | 10.8 | Taylor series  |   |  |
| 42 |      | Review   |   |  |
| 43 |      | Exam 2   |   |  |

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| 44 |      | Exam 2                      |   |
|----|------|-----------------------------|---|
| 45 | 8.2  | Arc length and surface area | 7, 9, 11, 13, 19, 22, 38, 43  |
| 46 | 8.2  | Arc length and surface area |   |
| 47 | 11.1 | Parametric equations        | <b>10, 11</b> , <b>13</b> , 15, 17, 19, <b>21</b> , <b>27</b> , 31, <b>41, 47</b> |
| 48 | 11.1 | Parametric equations        |   |
| 49 | 11.2 | Arc length and speed        | <b>5</b> , <b>7</b> , <b>17</b> , <b>18</b> , 31, 33, <b>36</b>                   |
| 50 | 11.2 | Arc length and speed        |   |
| 51 | 11.3 | Polar coordinates           | <b>3</b> , <b>5</b> , <b>16</b> , <b>17</b> , <b>21</b> , 27, 31, 33, <b>47</b>   |
| 52 | 11.3 | Polar coordinates           | MATLAB 5: Polar Graphs  |
| 53 | 11.4 | Area in polar coordinates   | <b>7</b> , <b>9</b> , <b>10, 12, 13</b> , 14, 16                                  |
| 54 | 11.4 | Area in polar coordinates   |   |
| 55 |      | Final review                |   |
| 56 |      | Final review                |   |

## ROLE IN CURRICULUM

MTH 232 is the second course of a three-semester sequence in calculus.

### LEARNING GOALS AND ASSESSMENT PLAN

| Learning Goal                              | Assessment |
|--|------------|
| Find areas between curves and volumes      | NA         |
| of solids of revolution using definite in- |            |
| tegrals.                                   |            |
| Determine whether a given infinite se-     | NA         |
| ries converges or diverges.                |            |
| Solve applied problems using calculus      | NA         |
| of vector-valued functions.                |            |
|  | NA         |

When assessment activities are done, the results will be summarized in memorandum form and filed with the department chairperson for record keeping purposes.

Information obtained from assessment will be used to assess and self-reflect on the success of the course and to make any necessary changes to improve teaching and learning effectiveness.

## Undergraduate Catalog Course Description

## College of Staten Island

| Course prefix:      | MTH  |
|---------------------|--|
| Course number:      | 232  |
| Course title:       | Analytic Geometry and Calculus II  |
| Subject             | Mathematics  |
| Minimum credits:    | 3  |
| Maximum credits:    | 3  |
| Hours per week:     | 4  |
| Course description: | The second of a three-semester se-<br>quence in calculus. Topics include ar-<br>eas between curves, volumes of solids<br>of revolution, techniques of integration,<br>sequences and series, improper inte-<br>grals, polar coordinates, and paramet- |
|                     | ric representative of curves.  |
| Prerequisite:       | MTH 230 or MTH 231 MTH 229.  |
| Comments:           | MTH 229.   |