NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT:	Mathematics
COURSE:	MAT 1575
TITLE:	Calculus II
DESCRIPTION:	A continuation of MAT 1475. Topics include Taylor polynomials, Mean Value Theorem, Taylor and Maclaurin series, tests of convergence, techniques of integration, improper integrals, areas, volumes and arc lengths.
TEXT:	E. Herman and G. Strang Calculus Volume 1, OpenStax, Rice University, Houston Texas USA 2017 Calculus Volume 2, OpenStax, Rice University, Houston Texas USA 2017.
CREDITS:	4
PREREQUISITE:	MAT 1475

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Fall 2019

A. Testing Guidelines:
The following exams should be scheduled:
1. A one-hour exam at the end of the First Quarter.
2. A one session exam at the end of the Second Quarter.
3. A one-hour exam at the end of the Third Quarter.
4. A one session Final Examination.

B. A graphing calculator is required.

Course Intended Learning Outcomes/Assessment Methods

Learning Outcomes	Assessment Methods
1. Find anti-derivatives using integration by parts, trigonometric substitution, and the technique of partial fractions.	Classroom activities and discussion, homework, exams.
2. Apply knowledge of integration to calculate volumes of solids of revolution, areas, and arc lengths.	Classroom activities and discussion, homework, exams.
3. Evaluate improper integrals.	Classroom activities and discussion, homework, exams.
4. Find Taylor polynomials and use Taylor's Theorem to estimate error.	Classroom activities and discussion, homework, exams.
5. Construct infinite series and test for their convergence and divergence.	Classroom activities and discussion, homework, exams.

General Education Learning Outcomes/Assessment Methods

Learning Outcomes	Assessment Methods
1. Understand and employ both quantitative and qualitative analysis to solve problems.	Classroom activities and discussion, homework, exams.
2. Employ scientific reasoning and logical thinking.	Classroom activities and discussion, homework, exams.
3. Communicate effectively using written and oral means.	Classroom activities and discussion, homework, exams.
4. Use creativity to solve problems.	Classroom activities and discussion, homework, exams.

<u>New York City College of Technology Policy on Academic Integrity</u>

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

MAT 1575 Calculus II **Text**: E.Herman & G.Strang, Calculus Volume 1&2 OpenStax

Session	Topic	Homework
1	**4.10** Antiderivatives (p. 485 – 496) **[Volume 1]**	**P. 497:** 465, 470, 471, 476, 477, 481, 484, 490, 492, 493, 495, 496, 499, 500, 501
2	**1.2** The Definite Integral (p. 27 – 39) **1.3** The Fundamental Theorem of Calculus (p. 50 – 57)	**P. 42:** 71, 73, 75, 76, 77, 80, 88, 89, 90, 92 **P. 60:** 170, 171, 172, 182, 183, 184, 187
3	**1.5** Substitution (p. 82 – 89) **1.6** Integrals Involving Exponential and Logarithmic Functions (p. 94 – 96, 98 - 102)	**P. 90:** 256, 258, 261, 265, 271, 273, 275, 276, 292, 293 **P. 103:** 320, 321, 322, 325, 327, 328, 330, 332, 335, 337, 338, 355 – 363 all
4	**3.1** Integration by Parts (p. 261 – 268)	**P. 270:** 7, 8, 13, 15, 16, 19, 20, 27, 31, 38, 42, 43, 45
5	**3.2** Trigonometric Integrals (p. 273 – 282)	**P. 283:** 73, 74, 78 – 85 all, 91, 97, 98, 100
6	**3.3** Trigonometric Substitution (p. 285 – 293)	**P. 296:** 126, 128, 135 – 143 odd, 147 – 153 odd
7	**3.3** Trigonometric Substitution (continued) [cover problems #132 on p. 196 and #164 on p. 297]	**P. 296:** 131, 133, 134, 160 – 163 all, 164
8	**First Examination**	
9	**3.4** Partial Fraction Decomposition (p. 298 – 303)	**P. 308:** 183, 185, 187, 196, 197, 199, 200 – 204 all
10	**3.4** Partial Fraction Decomposition (cont.) (p. 303 – 306)	**P. 308:** 189, 198, 205, 206, 207, 209 – 212 all, 215, 217
11	**3.7** Improper Integration (p. 330 – 340)	**P. 343:** 347 – 373 odd
12	**6.3** Taylor and Maclaurin Polynomials (p.562--567)	**P. 578**: 118—123 all
13	**6.3** Taylor and Maclaurin Polynomials (continued) (p.567--573)	**P. 578**: 125, 127, 28, 133, 135
14	**Midterm Examination**	
15	**5.1** Sequences (p.427--444)	**P. 447**: 1, 3, 7, 9, 12, 13--15 odd, 23--37 odd, 47--51 odd
16	**5.2** Infinite Series (p.450--459)	**P. 466**: 67--74, 76, 77, 79, 80, 83--85 odd, 89—95 odd

17	**5.3** The Divergence and Integral Tests (p.471--478)	**P. 482**: 138, 139--145 odd, 152—155, 158, 159, 161, 163
18	**5.4** Comparison Tests (p.485--492)	**P. 493**: 194—197all, 199, 200, 202, 204—206 all, 211 (optional: 222-223)
19	**5.5** Alternating Series (p.496--502)	**P. 505**: 250--257 all, 261—264 all, 266, 267
20	**5.6** Ratio and Root Tests (p.509--519)	**P. 522**: 317--320 all, 323, 325, 328, 329--335 odd, 349, 351
21	**6.1** Power Series and Functions (p.531--537) **6.2** Properties of Power Series (p.544--548, 552--557)	**P. 541**: 13-21 odd, 24, 28 **P. 558**: 87—90 all, 96, 97
22	**6.3** Taylor and Maclaurin Series (p.561--562, 573--576) **6.4** Working with Taylor Series (p.584--587, 590--592)	**P. 578**: 118-123 all, 140—147 all, 151—155 all **P. 596**: 203, 206, 207, 209, 219--223 odd
23	**Third Examination**	
24	**1.1** Approximating Areas (p. 5 – 20)	**P. 21**: 1 – 7 odd, 12, 15, 16, 17
25	**2.1** Areas Between Two Curves (p. 122 – 128)	**P. 131**: 1 – 7 all, 11, 15 – 21 all, 23 **P. 271**: 63
26	**2.2** Determining Volumes by Slicing (p. 141 – 149)	**P. 150**: 58, 59, 74 – 80 all, 98 – 102 all Find the volume of the solid obtained by rotating the region bounded by the curves $y = x^2$, $y = 12-x$, $x = 0$ and $x \geq 0$ about (a) the x–axis; (b) the line $y = -2$; (c) the line $y = 15$; (d) the y-axis; (e) the line $x = -5$; (f) the line $x = 7$.
27	**2.3** Volumes of Revolution: Cylindrical Shells (p. 156 – 165)	**P. 166**: 120 – 131 all, 140-143 all, 145, 148, 158, 159 **P. 271**: 61
28	**2.4** Arc Length of a Curve and Surface Area (p. 169 – 179)	**P. 180**: 165, 166, 171, 173, 174, 176, 177, 191, 192 **P. 284**: 119
29	**Review**	
30	**Final Examination**	