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: G. Hartman, et. al, APEX Calculus, version 3.0, CC 2015.

CREDITS: 4

PREREQUISITE: MAT 1475

Prepared by:
Prof. Henry Africk
Prof. Samar ElHitti
Prof. Neil Katz
Prof. Lin Zhou
Fall 2015

Updated:
Prof. Henry Africk, Spring 2016
Prof. Samar ElHitti, Spring 2017

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.

Mathematics Department Policy on Lateness/Absence

A student may be absent during the semester without penalty for 10% of the class instructional sessions. Therefore,

If the class meets:	The allowable absence is:
1 time per week	2 absences per semester
2 times per week	3 absences per semester

Students who have been **excessively absent and failed the course at the end of the semester will receive either**

- the WU grade if they have attended the course at least once. This includes students who stop attending without officially withdrawing from the course.
- the WN grade if they have never attended the course.

In credit bearing courses, the WU and WN grades count as an F in the computation of the GPA. While WU and WN grades in non-credit developmental courses do not count in the GPA, the WU grade does count toward the limit of 2 attempts for a developmental course.

The official Mathematics Department policy is that two latenesses (this includes arriving late or leaving early) is equivalent to one absence.

Every withdrawal (official or unofficial) can affect a student's financial aid status, because withdrawal from a course will change the number of credits or equated credits that are counted toward financial aid.

New York City College of Technology Policy on Academic Integrity

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**: G.Hartman, APEX Calculus, Version 3.0

Session	Topic	Homework
1	**5.1** Antiderivatives and Indefinite Integration (p. 189-196)	**P. 197**: 2, 9 – 25 odd, 29 – 35 odd
2	**5.2** The Definite Integral (p. 199 – 206) **5.4** The Fundamental Theorem of Calculus (p. 228 – 232)	**P. 207**: 5 – 13 odd, 18, 19, 20 **P. 238**: 5, 6, 7, 8, 9 – 27 odd
3	**6.1** Substitution (p. 255 – 261; 270 – 271, through Example 147 and then Examples 157, 158. The section on trigonometric substitution should be included in sessions 6 and 7 when there is more time)	**P. 272**: 3 – 19 odd, 25 – 33 odd, 77, 79
4	**6.2** Integration by Parts (p. 275-283)	**P. 284**: 5 – 11 odd, 17 – 27 odd, 39, 41
5	**6.3** Trigonometric Integrals (p. 286 – 294. Omit Example 170)	**P. 295**: 5, 7, 9, 10, 17 – 29 odd, 33
6	**6.4** Trigonometric Substitution (p. 296 – 300)	**P. 304**: 7,8, $\int \frac{x^2}{\sqrt{4-x^2}}\,dx$, $\int \frac{x^3}{\sqrt{x^2+9}}\,dx$, $\int \frac{\sqrt{x^2-9}}{x^4}\,dx$, $\int \frac{1}{x^2\sqrt{4-x^2}}\,dx$, $\int \frac{1}{x^2\sqrt{x^2+9}}\,dx$, $\int \frac{\sqrt{x^2-9}}{x^4}\,dx$
7	**6.4** Trigonometric Substitution (continued, p. 301 – 303)	**P. 304**: 15, 17, 18, 23, 25, 27, 31, 32
8	**First Examination**	
9	**6.5** Partial Fraction Decomposition (p. 305 – 309) Linear terms: Example 182, 183 and 184	**P. 312**: 7 – 9, 13 – 16, 26, 27
10	**6.5** Partial Fraction Decomposition (continued, p. 305 – 311) Linear and quadratic terms: Example 181 and 185	**P. 312**: 11, 12, 17 – 19, 22, 24, 28, 29
11	**6.8** Improper Integration (p. 333 – 338)	**P. 343**: 7 – 12, 15 – 18, 23 – 25, 27 – 30, 33
12	**8.7** Taylor Polynomials (p. 465 – 468)	**P. 475**: 5 – 20
13	**8.7** Taylor Polynomials (continued, p. 469--474) **3.2** The Mean Value Theorem (p.131 – 134)	**P. 475**: 21 – 24, 25, 27, 29 – 33
14	**Midterm Examination**	

15	**8.1** Sequences (p. 397 – 408)	**P. 409**: 5, 6, 9 – 11, 17 – 27 odd
16	**8.2** Infinite Series (p. 411 – 423)	**P. 424**: 14 – 16, 19, 21 – 29 odd, 35, 39
17	**8.3** Integral and Comparison Tests (p. 426 – 432)	**P. 433**: 1, 2, 8, 10, 11, 15, 17, 19, 20, 23 – 29 odd, 33 – 39
18	**8.3** Integral and Comparison Tests (continued, p. 426 – 432)	**P. 433**: 1, 2, 8, 10, 11, 15, 17, 19, 20, 23 – 29 odd, 33 – 39
19	**8.4** Ratio and Root Tests (p. 435 – 438)	**P. 439**: 5 – 9 odd, 10, 15 – 19 odd, 22, 25 – 28, 31, 32
20	**8.5** Alternating Series and Absolute Convergence (p. 441 – 449)	**P. 450**: 2, 3, 5 – 9, 11 – 15 odd, 16, 19
21	**8.6** Power Series (p. 452 – 462)	**P. 463**: 2, 9 – 17, 19, 20, 25, 27
22	**8.8** Taylor Series (p. 477 – 486)	**P. 487**: 7 – 12, 25-29, 31, 32
23	**Third Examination**	
24	**5.3** Riemann Sums (p. 210 – 225)	**P. 226**: 2, 4, 5 – 21 odd 27 – 31 odd
25	**5.4** The Fundamental Theorem of Calculus (p. 233 – 234) **7.1** Areas Between Two Curves (p. 346 – 350)	**P. 239**: 49 – 52 **P. 351**: 1, 5 – 15 odd, 19
26	**7.2** Volume by Cross-Sectional area; Disk and Washer Methods (p. 353 – 358)	**P. 359**: 5, 7, 9, 11, 13, 17
27	**7.3** The Shell Method (p. 461 – 366)	**P. 367**: 5, 7, 9, 11, 13
28	**7.4** Arc Length and Surface Area (p. 369 – 376)	**P. 377**: 3, 5, 9, 29, 31, 33
29	**Review**	
30	**Final Examination**	