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

DEPARTMENT: Mathematics

COURSE: MAT 1475

TITLE: Calculus I

DESCRIPTION: Topics include functions, limits, differentiation, and tangent lines, L'Hôpital's Rule, Fundamental Theorem of Calculus and Applications.

TEXT: Calculus, Volume 1, openstax.org

E. Herman and G. Strang

CREDITS: 4 (4 class hours)

PREREQUISITES: MAT 1375 or qualifying score on the mathematics placement exam.

Prepared by: Henry Africk and Satyanand Singh

Fall, 2019

A. Testing Guidelines:

The following exams should be scheduled:

1. A one session exam at the end of the First Quarter.
2. A one session exam at the end of the Second Quarter.
3. A one session 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. Solve problems related to limits and continuity.	Classroom activities and discussion, homework, exams.
2. Find the derivative of functions using the definition, sum rule, product rule, quotient rule, and the chain rule.	Classroom activities and discussion, homework, exams.
3. • Use the derivative of a function to find an equation for the tangent line at a point. • Use L'Hôpital's Rule to evaluate limits. • Sketch the graph of functions. • Solve optimization problems. • Solve related rates problems.	Classroom activities and discussion, homework, exams.
4. Evaluate definite and indefinite integrals of polynomials, trigonometric and exponential functions.	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.

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 1475 Calculus I **Text**: E. Herman, G. Strang, Calculus, Volume 1, openstax.org

Session	Calculus I	Homework Exercises
1	**2.2** The Limit of a Function (**pages** 135 – 153)	**P. 154**: 30-33 all, 35, 38, 42, 46-49 all
2	**2.3** The Limit Laws (**pages** 160 – 174)	**P. 176**: 83-105 odd
3	**2.4** Continuity (**pages** 179 – 188)	**P. 191**: 131-135 all, 137-147 odd
4	**3.1** Defining the Derivative (**pages** 213 – 227)	**P. 228**: 1, 3, 11-17 odd, 21-25 odd
5	**3.2** The Derivative as a Function (**pages** 232 – 242)	**P. 243**: 54-58 all, 61, 62
6	**3.3** Differentiation Rules (**pages** 247 – 260**)**	**P. 263**: 106-113 all, 115-117 all
7	**3.4** Derivatives as Rates of Change (**pages** 266 – 270)	**P. 273**: 153, 155, 156, 157
8	**First Examination**	
9	**3.5** Derivatives of Trigonometric Functions (**pages** 277 – 284)	**P. 285**: 175-189 odd
10	**3.6** The Chain Rule (**pages** 287 – 296)	**P. 297**: 215-221 odd, 222, 229-237 odd
11	**3.7** Derivatives of Inverse Functions (**pages** 299 – 305)	**P. 306**: 265, 267, 279, 280, 281, 283
12	**3.8** Implicit Differentiation (**pages** 309 – 316)	**P. 317**: 300-303 all, 309, 313, 315, 319
13	**3.9** Derivatives of Exponential and Logarithmic Functions (**pages** 319 – 330)	**P. 331**: 331-333 all, 337, 340, 341, 346-348 all, 351
14	**4.1** Related Rates (**pages** 341 – 349)	**P. 350**: 1-9 odd, 10, 17-21 all, 25, 29
15	**Midterm Examination**	
16	**4.2** Linear Approximations and Differentials (**pages** 354 – 363)	**P. 364**: 62, 63, 65, 67, 68, 69,70, 72, 73, 74, 78, 79, 80
17	**4.3** Maxima and Minima (**pages** 366-375)	**P. 376**: 101, 103, 108-113 all, 118, 119, 122, 124, 129, 130

18	**4.4** The Mean Value Theorem (**pages** 379-387)	**P. 388**: 153, 155, 157, 161, 164, 165, 168, 171, 174, 176, 179, 186, 187, 188
19	**4.5** Derivatives and the Shape of a Graph (**pages** 390-402)	**P. 403**: 201, 203, 207, 212, 213, 214, 223, 224, 225, 229
20	**4.6** Limits at Infinity and Asymptotes (**pages** 407-425)	**P. 436**: 251, 253, 256, 257-273 odd, 274, 279, 281
21	**4.6 (**continued) Drawing the Graph of a Function (**pages** 425-435)	**P. 436**: 294, 295, 297, 298, 299, 301, 302
22	**4.7** Applied Optimization (**pages** 439-450)	**P. 451**: 315, 316, 318-322 all, 335, 336
23	**4.8** L'Hôpital's Rule (**pages** 454-464)	**P. 470**: 356, 359, 362-367, 373, 377, 380, 387, 393, 395
24	**Third Examination**	
25	**4.10** Antiderivatives (**pages** 485-496)	**P. 497**: 465, 468-471 all, 473, 475, 476, 477, 481, 482, 490-493 all, 499, 500, 502
26	**5.1** Approximating Areas (**pages** 507-522)	**P. 523**: 2, 12, 14-19 all
27	**5.2** The Definite Integral (**pages** 529-543)	**P. 545**: 72, 73, 76, 77, 80, 81, 88, 89, 91, 93
28	**5.3** The Fundamental Theorem of Calculus (**pages** 549-559)	**P. 562**: 149, 151, 153, 170, 171, 173, 174, 177, 179-183 all
29	**Review**	
30	**Final Examination**	