HOSTOS COMMUNITY COLLEGE
DEPARTMENT OF MATHEMATICS

MAT 220 **CALCULUS II**

CREDIT HOURS: **4.0**

EQUATED HOURS: **4.5**

CLASS HOURS: **4.5**

PREREQUISITE: **MAT 210 (Calculus 1) with a grade of C or higher.**

REQUIRED TEXTS: **Thomas: Calculus, Early Transcendentals, Single Variable, 13th Edition, Pearson**

DESCRIPTION: **This course provides skills in differential and integral calculus. Topics: definite integral and its properties, numerical integration, applications of definite integrals to: areas between curves, volume of solids of revolution, arc length and surfaces. Sequences and infinite series. Tests for convergence. Taylor and Maclaurin series and applications.**

EXAMINATIONS: **A minimum of four partial tests (suggested: 60%) and a comprehensive final examination (40%).**

GRADES: **A, A⁻, B⁺, B, B⁻, C⁺, C, D, I, F.**

Math 220 (Calculus II) Student Learning Outcomes

1. Interpret and draw appropriate inferences of integrals of functions and their properties from quantitative representations such as graphs of polynomial, rational, exponential and logarithmic and trigonometric functions including polar coordinates, surface area and arc length.
2. Use algebraic, numerical and graphical methods to solve mathematical problems including finding the anti-derivative of a function, determining indefinite integrals, calculating definite integrals, determining the area and volumes between curves.
3. Represent quantitative problems expressed in natural language in suitable algebraic, functional and graphical form. Such problems include as determining area between two graphs, finding the volume of solids of revolution and solving initial value problems.
4. Effectively communicate solutions to mathematical problems in written, graphical or analytic form.
5. Evaluate solutions to problems and graphs of functions for reasonableness by inspection. Estimate the value of definite integrals using the Trapezoidal Rule and Simpson's Rule.
6. Apply calculus based methods to problems in other fields of study such as Physics, Economics, Geometry, Chemistry or Biology.

COURSE OUTLINE

WEEK	CLASS	TOPICS
1	1	Review of the Definite Integral
	2	The Indefinite Integral and the Substitution Rule
	3	Integration by Substitution
2	4	Area Between Curves
	5	Volumes using Cross-Sections
	6	Volumes using Cross-Sections, continued
3	7	Volumes using Cylindrical Shells
	8	(should include a day of review and comparison of methods, not in Thomas)
	9	Arc Length and Areas of Surfaces of Revolution
4	10	Applications to Work, Moments and Centers of Mass
	11	**Review For Exam 1**
	12	**EXAM 1 (Suggested 15%)**
5	13	The Logarithm Defined as an Integral and Hyperbolic Functions
	14	Integration by Parts (there should be sections on algebraic subs and CTS)
	15	Trigonometric Integrals
6	16	Trigonometric Substitution
	17	Partial Fractions
	18	Partial Fractions, continued
7	19	Integral Tables and Computer Algebra Systems
	20	**Review for Exam 2 (technique of integration given)**
	21	**EXAM 2 (Suggested 15%)**
8	22	(Needs a review day for techniques of integration but not in Thomas)
	23	Improper Integrals
	24	Improper Integrals, continued
9	25	(More mixed practice with integrals, both proper and improper)
	26	**Review For Exam 3 (technique of integration not given)**
	27	**EXAM 3 (Suggested 15%)**
10	28	Sequences
	29	Infinite Series
	30	The Integral Test
11	31	Comparison Tests
	32	Ratio and Root Test
	33	Alternating Series
12	34	Absolute and Conditional Convergence
	35	Power Series
	36	Power Series, continued
13	37	Taylor and Maclaurin Series
	38	Convergence of Taylor Series
	39	Binomial Series and Applications of Taylor Series
14	40	**Review For Exam 4**
	41	**EXAM 4 (Suggested 15%)**
	42	**Review for Final (Suggested 40%)**
15		**Final Exam**