MATH 211 (Calculus for Chemists)

Credits 3 (3+0) **Pre-requisites: Differential calculus (MATH101)**

Note: No Proofs are required

Text book # 1: Calculus for Biology and Medicine, 3rd edition, By Claudia Neuhauser

Text book # 2: Calculus, The Classic Edition, By Earl Swokowski

Text Book	Topics	Section number and contents
book # 1	**Ch. 1: Preview and Review**	**1.1.6:** Complex Numbers and Quadratic Equations: All 1.2.5: From Definition p.25 with p.26 1.2.7: From p.30 until Ex.14
	Ch4: Differentiation	4.6: Equations (4.8) & (4.9) p.179, Ex. 1,2, Equation (4.11), Ex,3 4.7.2: p.189 and 190 4.7.3: All
	Ch. 5 : Applications of Differentiations	5.8: Definition p.267, Corollary 2,3, Ex 1,2
	Ch. 6 : Integration	6.1.1 The Area Problem: Brief explanation of the concept, Theorem p.283 6.1.3: Properties p.286 & 287 & 289, Ex 13, Write the following as one integral: $\int_0^2 x^2\,dx - \int_0^1 x^2 dx.$ 6.2.2: Ex. 6, 7, 8, Table 6.1, Ex. 9,10, Exercise 41, 47 6.2.3: FTC Part II p.302, Ex 11→15, Solve $\int_{-2}^{3} \lvert x \rvert dx$ 6.3.1 Areas (between curves): Box p.308, Ex 2,3, Box p.311 6.3.4 The Volume of a Solid: Disk method p.316, Ex. 8,9,10
	Ch. 7 : Integration Techniques	7.1.1: Substitution Rule p.326, Ex 1→5 7.1.2: Substitution Rule p.329, Ex 7→10 7.2.1: Integration by parts: All 7.3.1: Proper Rational Functions: Ex 1, 2

		7.3.2: Partial Fractions Decomposition: Ex.3→7 7.4: Improper Integrals: 7.4.1: Type 1: All 7.4.2: Type 2: All+ Section 5.5 **L'Hospital's Rule**:Box p.247, Ex 1→8
	Ch. 9: Linear Algebra and Analytic Geometry	9.1.1 Linear System: All except Ex 4 9.1.2 Method of Gaussian elimination, Definition p.439, Ex 8 Solve the following linear system using Gaussiann elimination $$\begin{cases} 2x - 4y + 6z = 18 \\ -x + 3y \quad = -4 \\ 2x - 5y + 5z = 17, \end{cases}$$ 9.2.1 Basic Matrix Operations: All 9.2.2 Matrix Multiplication: All except Ex 8 9.2.3 Inverse Matrices (Determinants): Definition p.450, Theorem p. 454, Definition 454, Theorem p. 455, Ex 13 9.2.4 Computing Inverse Matrices: Ex 15, 16, Compute the inverse of $A = \begin{bmatrix} 1 & -1 & 0 \\ 1 & 0 & -1 \\ 6 & -2 & -3 \end{bmatrix}$ 9.4.1 Points and Vectors in Higher Dimensions: All
	Ch. 10: Multivariable Calculus	10.1: Definition p.504, Ex 1 10.3.1: Definition p.519, Ex 1, 2, 3 10.3.2: Ex 5 10.3.3: Ex 6, The Mixed Derivative Theorem
book # 2	**Ch. 13: Plane Curves and Polar Coordinates**	13.1: Plane Curves: Definition 13.1 & 13.2, Ex 1→4 13.3: Polar Coordinates: Introduction p. 658-659, Ex 1, 2, 4, Relationship between rectangular and polar coordinates 13.8, Ex 6,7,8. 13.4: Theorem 13.11 & Guidelines for finding the area of an R_θ region (13.12), Ex 1.