Calculus I (Electronics) Course Content by Chapter (8th Edition)

Chapter 23 The Derivative (3 weeks):

Textbook Section	Topic	Relevent Exercises
§23.1 Limits	• Limits • Continuity	p.652 21-42, 50-54 p.652 5-20
§23.2 The Slope of a Tangent to a Curve	• Slope of a tangent line at a specific point • Slope of a tangent line at a general Point	p.656 7-10 p.656 11-22
§23.3 The Derivative	• Definition of the derivative	p.660 3-38
§23.4 The Derivative as an Instantaneous Rate of Change	• Applications to velocity/acceleration • Applications to electronics	p.664 11-24, 25, 26 p.664 27, 31
§23.5 Derivatives of Polynomials	• Derivatives of polynomials • Applications to velocity/acceleration • Applications to electronics	p.669 5-28, 37-41, 43, 51 p.669 29-36, 44 p.669 47
§23.6 Derivatives of Products and Quotients	• Derivatives of products and quotients (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.673 3-32, 35, 37-41 p.673 43 p.673 45, 48, 51
§23.7 Derivative of a Power of a Function	• Derivatives of powers (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.679 5-36, 39-43 p.679 45 p.679 53, 54
§23.8 Differentiation of Implicit Functions	• Implicit differentiation (polynomial) • Applications to electronics	p.683 3-32 p.683 37
§23.9 Higher Derivatives	• Higher order derivatives of polynomials • Applications to velocity/acceleration • Applications to electronics	p.686 3-36, 41-42 p.686 37-40, 43, 44, 48 p.686 45
Chapter 23 Review	• Limits • Definition of derivative • Derivatives (polynomials) • Implicit differentiation (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.688 1-12, 47 p.688 13-20 p.688 21-34, 37-44, 49-52 p.688 35, 36 p.688 53, 54, 56, 58, 60 p.688 59, 61, 65, 69

Chapter 24 Applications of the Derivative (2 weeks):

Textbook Section	Topic	Relevent Exercises
§24.1 Tangents and Normals	• Tangent and normal lines • Tangent and normal lines involving implicit differentiation • Applications to electronics	p.694 3-5, 7-9, 11-17, 20 p.694 6, 10, 18, 19, 21 p.694 25
§24.2 Newton's Method for Solving Equations	• Using Newton's method • Applications to electronics	p.698 5-19 p.698 26
§24.4 Related Rates	• Related rates problems involving velocity/acceleration • Other related rates problems	p.705 5, 8, 10, 24 p.705 3-4, 6, 9, 15, 16, 18-22, 29-31
§24.5 and §24.6 Using Derivatives in Curve Sketching	• Sketching polynomials • Sketching rational functions and functions involving square roots • Sketching functions related to electronics	p.712 5-32 p.717 2-18 p.712 41 and p.717 24, 26
§24.7 Applied Maximum/Minimum Problems	• Max/min problems related to electronics • Other max/min problems	p.722 5, 9, 12, 14, 30, 34 p.722 3, 11, 13, 15-28, 32, 33, 35-41, 43, 44
Chapter 24 Review	• Tangent and Normal Lines • Newton's Method • Related rates problems involving electronics • Other related rates problems • Curve sketching • Max/min problems related to electronics • Other max/min problems	p.729 1-6, 41, 42 p.729 13-16, 44 p.729 48, 56 p.729 63, 69, 73 p.729 17-24, 53, 54 p.729 51, 65 p.729 67, 71, 74, 75

Chapter 27 Differentiation of Transcendental functions (3 weeks):

Textbook Section	Topic	Relevent Exercises
§27.1 Derivatives of the Sine and Cosine Functions	• Derivatives of sine and cosine functions	p.801 3-34, 43-46, 50
	• Implicit differentiation of sine and cosine functions	p.801 41, 42
	• Applications to velocity/acceleration	p.801 53
	• Applictions to electronics	p.801 51, 54
§27.2 Derivatives of the Other Trigonometric Functions	• Derivatives of trigonometric functions	p.805 3-32, 43-48
	• Implicit differentiation of trig. functions	p.805 33, 34
	• Applications to velocity/acceleration	p.805 49, 51
	• Applications to electronics	p.805 50
§27.3 Derivatives of Inverse Trigonometric Functions	• Derivatives of inverse trigonometric functions	p.809 3-31, 34, 39, 43-46
	• Implicit differentiation of inverse trig. functions	p.809 32, 33
	• Applications to electronics	p.809 49
§27.4 Applications (Trigonometric Functions)	• Tangent and normal lines	p.813 5, 9, 10
	• Related rates problems involving electronics	p.813 18
	• Other related rates problems	p.813 23, 26
	• Newton's method	p.813 11, 12
	• Max/min problems	p.813 14, 31
	• Applications to velocity/acceleration	p.813 15, 20
§27.5 Derivative of the Logarithmic Function	• Derivatives of logarithmic functions	p.818 3-31, 40-42, 45, 46, 53, 54
	• Implicit differentiation of logarithmic functions	p.818 32-34
	• Logarithmic differentation	p.818 47, 48
	• Applications to electronics	p.818 50, 56
§27.6 Derivative of the Exponential Functions	• Derivatives of exponential functions	p.822 3-24, 27-32, 36-38, 43-50
	• Implicit differentiation of exponential functions	p.822 25, 26
	• Applications to electronics	p.822 51
§27.7 Applications (Logarithmic and Exponential Functions)	• Tangent and normal lines	p.825 17-20
	• Newton's Method	p.825 21-22, 34
	• Applications to velocity/acceleration	p.825 35, 36
	• Applications to electronics	p.825 23, 25, 28, 32
Chapter 27 Review	• Derivatives of transcendental functions	p.827 1-31, 35, 36, 38-40, 49, 50
	• Implicit differentiation of transcendental functions	p.827 32-34, 37
	• Tangent and normal lines	p.827 45-48
	• Newton's method	p.827 51, 52, 82
	• Related rates problems	p.827 74, 77
	• Applications to velocity/acceleration	p.827 57, 60
	• Applications to electronics	p.827 61, 72, 78

Chapter 25 Integration (2 weeks):

Textbook Section	Topic	Relevent Exercises
§25.1 Antiderivatives	• Antiderivatives	p.735 5-36
§25.2 The Indefinite Integral	• Indefinite integrals involving polynomials • Applications to electronics	p.740 5-46, 55, 56 p.740 49, 50, 52
§25.3 The Area Under a Curve	• Approximating areas under a curve	p.745 5-23
§25.4 The Definite Integral	• Definite integrals involving polynomials • Applications to electronics	p.748 3-35, 37, 38 p.748 44
§25.5 The Trapezoid Rule	• Trapezoid Rule	p.751 3-14, 18
§25.6 Simpson's Rule	• Simpson's Rule	p.755 3-12, 16
Chapter 25 Review	• Indefinite integrals involving polynomials • Definite integrals involving polynomials • Trapezoid Rule • Simpson's Rule • Applications to electronics	p.756 1-10, 13-16, 19-22, 25, 26, 52 p.756 11, 12, 17, 18, 23, 24, 29, 30, 31, 32, 44 p.756 41, 42, 46 p.756 43, 47 p.756 50, 7 (Practice Test)

Chapter 26 Applications of Integration (2 weeks):

Textbook Section	Topic	Relevent Exercises
§26.1 Applications of Integration	• Applications to velocity/acceleration • Applications to electronics	p.765 3-16 p.765 17-24, 27
§26.2 Areas by Integration	• Area between curves • Applications to electronics	p.769 3-28, 31, 32 p.769 38
§26.6 Other Applications (**time permitting*)	• Work done by a variable force • Force due to liquid pressure • Average value of a function	p.791 5-18 p.791 19-28 p.791 29-31
Chapter 26 Review	• Applications to velocity/acceleration • Applications to electronics • Area between curves • Work done by a variable force (**time permitting*) • Force due to liquid pressure (**time permitting*) • Average value of a function (**time permitting*)	p.794 1-6, 41, 53 p.794 8-10 p.794 13-20 p.794 37, 38 p.794 45, 46 p.794 47

Chapter 28 Methods of Integration (2 weeks) :

Textbook Section	Topic	Relevent Exercises
§28.1 The General Power Formula	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.834 3-8, 11-16, 19-24, 31, 32 p.834 17, 18, 25, 26 p.834 27, 28 p.834 35
§28.2 The Basic Logarithmic Form	• Indefinite integrals • Definite integrals • Applications to electronics	p.837 3-10, 13-18, 21-28, 33, 34, 37 p.837 11, 12, 19, 20, 29, 30, 32 p.837 41, 44
§28.3 The Exponential Form	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.840 3-10, 13-16, 19-24, 29, 30, 32 p.840 11, 12, 17, 18, 25, 26, 38 p.840 27, 28, 36 p.840 37
§28.4 The Basic Trigonometric Forms (**time permitting*)	• Indefinite and definite integrals • Areas by integration • Applications to electronics	p.844 3-26 p.844 27, 28 p.844 34
§28.6 Inverse Trigonometric Forms (**time permitting*)	• Indefinite and definite integrals	p.852 3-26
Chapter 28 Review	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.872 1-3, 7-8, 15, 16, 19-21, 23-27, 30-36, 39-40, 43, 48 p.872 4, 5, 9-12, 22, 28, 29, 37, 38 p.872 54 p.872 68