Course Content & Tentative Schedule

[R] Antiderivatives Reimann Sums The Fundamental Theorem of Calculus	• Area under a simple curve using Reimann Sum. • Definite integral as the limit of a Riemann Sum. • Proof of the Fundamental Theorem of Calculus. • Substitution Rule • Average value of a function • Mean Value Theorem for integrals	**Chapter 5: 3 WEEKS** **[R]** §4.7: Antiderivatives (p. 252) | 1 −9, 12 −36, 39 −47, 50 **[R]** Chapter 4 Review (p.254) | 51−58 §5.1: Areas and Distances (p. 266) | 1, 3, 5, 13 −17 §5.2: The Definite Integral (p. 279) | 1, 3, 5, 11 −26, 29 −42, 48, 49, 51, 53 §5.3: Evaluating Definite Integrals (p. 289) | 1−18, 21−32, 37−40, 44−50, 69 §5.4: The Fundamental Theorem of Calculus (p. 298) | 1−20, 23* −25*, 27*, 31* **[R]** §5.5: The Substitution Rule (p. 306) | 1 −20, 22 −36 §5.5: The Substitution Rule (p. 307) | 37 −56, 65* −69* Chapter 5 True-False Quiz* (p. 308) | 1 −13 Chapter 5 Review (p. 309) | 7 −29, 31, 32, 35 −39, 42, 46, 50*
Techniques of Integration **[O]** Numerical Integration **[R]** Indeterminate Forms and L'Hôpital's Rule Improper Integrals	• Integration by parts • Trigonometric integrals using identities • Trigonometric substitutions • Partial fractions • **[O]** Approximate certain integrals using Simpson's Rule • **[R]** Evaluate limits of indeterminate forms using L'Hôpital's Rule • Determine the convergence of improper integrals	**Chapter 6: 4 WEEKS** §6.1: Integration by Parts (p. 316) | 1 −20, 22 −33, 44* −46* §6.2: Trigonometric Integrals and Substitutions (p. 326) | 1−64 §6.3: Partial Fractions (p. 334) | 1 −42, 44*, 46* **[O]** §6.5: Approximate Integration (p. 350) | 7−16 **[R]** §3.7:Indeterminate Forms and l'Hospital's Rule (p. 197) | 1 − 38 **[R]** Chapter 3 Review (p. 201) | 61 −64, 66 −76 §6.6: Improper Integrals (p. 360) | 1, 2, 5 −32, 47, 48*, 49, 52, 61, 62 Chapter 6 True-False Quiz* (p. 362) | 1 −7, 9 −14 Chapter 6 Review (p. 363) | 1 −50 (**[O]**: 57,58)
Applications of Integration	Extend the notion of the definite integral to calculate: • The area bounded between two curves • The volume of a solid of revolution: disk, washer, shell methods • Arc length	**Chapter 7: 2 and 1/2 WEEKS** §7.1: Areas between Curves (p. 369) | 1 −21, 33*, 35* −41* §7.2: Volumes (p. 378) | 1 −18, 27, 28, 31 §7.3: Volumes by Cylindrical Shells (p. 384) | 1 −20, 21 −26 (part (a) only), 33 −39, 41 §7.4: Arc Length (p. 391) | 1, 2, 7 −13, 15 −18 §7.6: Applications to Physics and Engineering (p. 408) Chapter 7 Review (p. 422) | 1 − 14, 25, 26
Infinite Sequences Infinite Series Taylor and Maclaurin Series	• Convergence or divergence of infinite sequences • Sum of an infinite series from the definition. • Geometric and telescoping series; applications • Tests for convergence of series: — Integral test, Comparison test, Limit comparison test, Ratio test, Root test, Alternating series test • Absolute and conditional convergence • Interval of convergence of a power series • Finding Maclaurin and Taylor series using definitions	**Chapter 8: 3 and 1/2 WEEKS** §8.1: Sequences (p. 434) | 1 − 32, 37 − 40, 52* §8.2: Series (p. 443) | 1 − 28, 31 − 40, 45*, 49* §8.3: The Integral and Comparison Tests (p. 452) | 3, 4, 6 − 30, 31* §8.4: Other Convergence Tests (p. 463) |3 − 8, 18*, 19 − 40, 43, 44*, 46*a* §8.5: Power Series (p. 468) | 3 − 25 §8.7: Taylor and Maclaurin Series (p. 487) | 1 − 8, 11 − 18 Chapter 8 True-False Quiz* (p. 497) | 1 − 18, 20, 21 Chapter 8 Review (p. 498) | 1 − 29, 36 − 40, 43 − 50

* = enriched or theoretical questions; **[R]** = review topic; **[O]** = optional topic

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