Math 141 Schedule

Sections labeled A refer to

T. Apostol. *Calculus* volume 1, 2nd ed. John Wiley and Sons, 2007.

Sections labeled R refer to

W. Rudin. *Principles of Mathematical Analysis*, 3rd ed. New York: McGraw Hill, 1964.

Date	Topics	Reading
M Aug 29.	Sets, the integers, induction, summation notation.	A.I.2.1–5, A.I.4.1–6
W Aug 31.	The rationals, $\sqrt{2}$ is irrational, field and order axioms, consequences of the l.u.b. property,.	R.1.1, A.I.3.2, A.I.3.5, A.I.3.7–13
M Sept 5.	No class – Labor day.	
W Sept 7.	Dedekind cuts, countability.	R.1.A, R.2.1
M Sept 12.	The complex numbers. Triangle and Cauchy-Schwarz inequalities. Functions.	A.9.1–5, A.I.4.8, A.1.2–4
W Sept 14.	Area axioms, area calculation, definition of the integral.	A.1.6–18
M Sept 19.	Integrable functions, computing integrals, basic properties.	A.1.19–27
W Sept 21.	Applications of integrals, indefinite integrals.	A.2.1–2.11, A.2.16–19
M Sept 26.	Definition of limits and continuity, properties, composite fns, Intermediate Value Theorem.	A.3.1-11
W Sept 28.	Midterm 1.	
M Oct 3.	Inverse functions, compactness properties and integrability of cts fns.	A.3.12–20
W Oct 5.	Further examples. Sperner's Lemma and the Brouwer Fixed Point Theorem.	
M Oct 10.	Definition of derivative and interpretations, taking derivatives.	A.4.1–9
W Oct 12.	The chain rule and implicit differentiation.	A.4.10–12
M Oct 17.	The mean value theorem and extrema, Jensen's inequality.	A.4.13–21

W Oct 19.	The Fundamental Theorem of Calculus.	A.5.1–5
M Oct 24.	Logs and exponentials and trig functions.	A.6.1–22
W Oct 26.	Integration by substitution and by parts.	A.5.7–11, A.6.23–25
M Oct 31.	Complex exponentials and trig identities, the Fund. Thm. of Algebra.	A.9.7, R.8.4
W Nov 2.	Midterm 2.	
M Nov 7.	Taylor's formula, big O and little o, indeterminant forms.	A.7.1–10
W Nov 9.	l'Hopital's rule and indeterminant forms.	A.7.11–15
M Nov 14.	Asymptotics of some standard functions, Newton's method.	A.7.16–17, R p118
W Nov 16.	First and second order constant coefficient ODE's.	A.8.1–14
M Nov 21.	Nonhomogeneous equations, geometric and physical problems.	A.8.15–28
W Nov 23.	No class – Thanksgiving.	
M Nov 28.	Infinite sequences and series, limits and properties.	A.10.1–9
W Nov 30.	Convergence tests.	A.10.12–22
M Dec 5.	Sequences of functions, integration and differentiation, power series.	A.11.1–7
W Dec 7.	Taylor series, exponential and trig functions, differential equations.	A.11.8–16