

Mathematics 138 Syllabus

Text: CALCULUS by Smith, Strauss and Toda sixth edition by Kendall Hunt.

You can get the Special Edition, Chapters 5-8, 11, 12, 14 (ISBN: 978-1-4652-4079-8) or the whole book (ISBN: 978-1-4652-0888-0).

Sections numbers beginning with A and B refer to the Rutgers supplements for Math. 138 and those beginning with UMAP to the UMAP supplement. These supplements are available for download and printing by students from the home page.

Suggested order of lectures

Lecture	Topic	Sections	Problems
1	Review: Antiderivatives, Finite Riemann's Sum, The Fundamental Theorem of Calculus Part 1 and Definite Integrals.	5.1, 5.2: example 1 5.3 pages 346 – middle of 351 5.4 pages 357 – top of 360	5.1: 5, 7, 17, 21, 22, 44. 5.2: 19, 21, 27. 5.3: 1, 3, 4, 33, 34, 35, 46. 5.4: 16, 17, 27, 28, 33.
2	Numerical Integration	5.8	5.8: 13, 14, 16, 19, 22, 23, 32, 39.
3	Applications to Business, Economics and Life Sciences	6.6	6.6: 5, 6, 8, 9, 13, 18, 19, 22, 23, 24, 28, 33.
4	Review of Substitution and Integration by Table	7.1	7.1: 9, 15, 23, 41, 43.
5	Integration By Parts	7.2	7.2: 2, 3, 8, 9, 18, 19, 21, 35.
6	Partial Fractions (only linear terms)	7.4 pages 531 – middle of 534	7.4: 1, 4, 5, 15, 16, 17, 21, 23, 34, 35.
7	Improper Integrals	7.7	7.7: 3, 6, 10, 12, 20, 31, 32, 38, 43, 48, 49.
8	Taylor and Maclaurin Series	8.8, only Taylor and Maclaurin Polynomials only!	8.8: Find the first 4 none zero terms of the Maclaurin polynomial of each of the functions given in problems 3, 4, and 14. Also do: 27, 28, 35.
9	Catch Up and Review		
10	First Midterm		
11	Introduction to Differential Equations Separation of Variables	5.6 pages 372 – 377	5.6: 1, 7, 9, 10, 21, 22, 24, 28, 45.
12	First Order Linear Differential Equations Euler's Method (no exact)	7.6, 14.1 (no exact)	7.6: 1, 2, 5, 11, 17, 20. 14.1: 7, 10, 27, 29.

13	Growth Models, Logistic Equation	A1, A2, 14.1 7.6 pages 548 - 550	A1: 1, 2 (page 3) A2:1, 2 (page 10) 7.6: 33, 34.
14			
15	Second Order Homogeneous Linear Differential Equation	14.2 pages 11213 - 1128	14.2: 1,2,5,9, 21, 22,23.
16	Higher Order Homogeneous Linear Differential Equation	14.2 from page 1128	14.2: 15, 16, 18,25,26, 27, 28.
17	Non Homogeneous Differential Equations: Undetermined Coefficients	14.3 pages 1136 – middle of 1140.	14.3: 3, 5, 7, 8, 19.
18	Non Homogeneous Differential Equations: Variation of Parameters	14.3 from the middle of page 1140	14.3: 32, 22, 43, 44, 45.
19	Catch Up and Review		
20	Second Midterm		
21	Systems of Linear Equations Matrices and their Algebra	B1, B2	B1: 1, 2a, 3a, 4, 5. B2: 1, 2, 3, 5, 7, 8, 10, 11, 13.
22	Determinants	B3, B4	B3: 1, 2, 3, 4, 5, 6, 7. B4: 1, 2.
23	Invertible Matrices, Cramer's Rule	B5, B6	B5: 1, 2, 3, 4. B6: 1, 2, 3, 4.
24	Eigenvalues and Eigenvectors	B7, B8	B7: 1, 2, 3. B8: 1, 2, 3, 4, 5.
25	Population Project	UMAP (1,2)	1 (page 4), 2 (page 10)
26		UMAP (3)	3 (page 12), 4 (page 13)
27		UMAP (3,4)	6, 7, 8 (page 17)
28	Catch Up and Review		