MATH 421 - Summer 2019 Schedule (Tentative)

Homework problems with * will be graded for correctness. All problems must be attempted.

Lecture	Section	Topics	Homework
1	7.6	Vector Spaces	17, 27*, 28*
	8.1	Matrix Algebra	15, 17, 19*, 23*, 29, 37, 39
	8.2	Systems of Linear Algebraic Equations	5, 9*, 11, 15*, 17*
2	8.3	Rank of a Matrix	1, 5, 7*, 13*, 15, 17
	8.4	Determinants	15, 19, 21, 25*, 27, 29
	8.5	Properties of Determinants	5, 9, 11, 13*, 23*, 31, 33*
3	8.6	Inverse of a Matrix	7*, 19, 23*, 31, 43, 51*, 53
	8.7	Cramer's Rule	1, 9, 11*
4	8.8	Eigenvalue Problem	3, 5, 13*, 15*, 21*
5	8.10	Orthogonal Matrices	1*, 5, 7, 13, 15*
	8.12	Diagonalization of Matrices	3*, 5*, 13*, 21, 27, 37*, 39*
6	4.1	Definition of the Laplace transform	1, 5, 7*, 13, 23*, 25, 29, 31, 39, 41
7	4.2.1	Inverse Laplace Transform	7, 8*, 11, 15, 17, 18*, 23
	4.2.2	Laplace Transform of Derivatives Linear Differential Equations	31, 32*, 35, 38*
8	4.3	Translation Theorems Unit Step Function (Heaviside Function)	3, 7, 9, 15, 19*, 24*, 40*, 41, 45, 49, 55, 63*

Lecture	Section	Topics	Homework
9	4.4.1	Derivatives of Transforms	3, 7, 8*, 11*, 13, 14*
	4.4.2	Transforms of Integrals; Convolution Volterra Integral Equation	19, 22, 25, 27*, 33, 37*, 39*
10	4.4.3	Transforms of a Periodic Function	49*, 51*, 52
	4.5	Dirac Delta Function Impulse Response Function	1, 2*, 3, 5, 9*
11	4.6	Systems of Linear Differential Equations	1, 2*, 7, 9*, 11*
12	12.1	Orthogonal Sets of Functions	1, 3*, 5*, 7, 8*, 9, 12, 15, 16, 17, 18*, 21
13	12.2	Fourier Series	1*, 2, 3*, 5*, 7, 9*, 11, 13, 17*, 19, 20*, 21
14	12.3	Fourier Sine and Cosine Series Half range expansions	1, 3, 5, 7, 13*, 14*, 19, 25*, 27, 29*, 41*
	12.4	Complex Fourier Series	1*, 3*, 5*, 11, 12
15	3.9	Example 2: Boundary Value Problems (BVP)	9, 11*
	12.5	Regular Sturm-Liouville Problems	1*, 2*, 3*, 5
16	13.1	Separable Partial Differential Equations	1*, 3*, 9*
17	13.2	Heat Equation and BVP	1, 3*, 5*, 9*
	13.3	Solution to BVP for Heat Equation	1*, 2*, 3*, 4*
18	13.2	Wave Equation and BVP	7, 8
	13.4	Solution to BVP for Wave Equation	1*, 2*, 5*, 8*, 11*

Lecture	Section	Topics	Homework
19	13.2	Laplace Equation and BVP	11
	13.5	Solution to Laplace's Equation in a Rectangle	1*, 3, 4
20	13.5	Dirichlet problem for Laplace's Equation in a Rectangle	5*, 7, 15*
21	13.6	Nonhomogeneous BVP (time-independent problems only)	1*, 5*
22	13.7	Orthogonal Series Expansions for BVP	1*, 5*
23	13.8	Fourier Series in Two Variables	1*, 3, 5