Math 240 Syllabus

Text:


(1) Linear algebra, 5 weeks

DELA, 2.1 Matrices: (T/F review) 6, 7, 9; (Problems) 9, 11, 23, 25

DELA, 2.2 Matrix algebra: (T/F review) 1, 5, 10; (Problems) 5, 13(a), 16, 19, 39, 43

DELA 2.3 Linear systems: (T/F review) 2, 4, 5; (Problems) 7, 15, 17

DELA 2.4 Row reduction, echelon matrices: (T/F review) 3, 5, 7; (Problems) 6, 15, 21

DELA 2.5 Solving linear systems: (T/F review) 3, 4; (Problems) 3, 10, 17, 22, 24, 35, 49

DELA 2.6 Inverse matrices: (T/F review) 4, 5, 7; (Problems) 9, 13, 17, 18, 29, 31, 38

DELA 3.1 Determinants: (T/F review) 2, 3, 6; (Problems) 9, 13, 19, 22

DELA 3.2 Properties of determinants: (T/F review) 2, 3, 6; (Problems) 5, 17, 21, 27, 31, 36, 38, 46, 49, 52

DELA 4.2 Vector spaces: (T/F review) 1, 4, 7; (Problems) 3, 11, 12, 19, 20

DELA 4.3 Subspaces: (T/F review) 1, 3, 4; (Problems) 7, 9, 17, 19, 22, 23

DELA 4.4 Span, linear conditions: (T/F review) 4, 9, 12; (Problems) 7, 9, 12, 15, 17, 19, 25, 27, 28

DELA 4.6 Bases and dimension: (T/F review) 4, 5, 8; (Problems) 6, 11, 15, 17, 23, 25, 28, 34

DELA 4.7 Change of basis: (T/F review) 3, 4, 7; (Problems) 5, 19, 23, 27, 38

DELA 4.9 Rank and nullity: (T/F review) 2, 5, 8; (Problems) 6, 9, 13, 15, 18
DELA 5.1 Linear maps: (T/F review) 2, 4, 6; (Problems) 4, 9, 15, 23, 27, 35

DELA 5.5 The matrix of a linear transformation: (T/F review) 1, 4, 6; (Problems) 3, 8, 11, 17, 20

DELA 5.6 Eigenvalues and eigenvectors: (T/F review) 1, 3, 7; (Problems) 15, 28, 29, 31, 34, 36

DELA 5.8 Diagonalization: (T/F review) 2, 3, 5; (Problems) 7, 13, 17, 22, 23, 24, 32

DELA 5.9 Matrix exponentials: (T/F review) 2, 3, 4; (Problems) 7, 11, 15, 19

DELA 5.11 Jordan canonical form (optional): (T/F review) 2, 5, 10, 12; (Problems) 3, 9, 11, 15, 19, 36

(2) Higher order ODE, 4 weeks

DELA 6.1 Linear ODE, initial value problems, boundary value problems: (T/F review) 2, 6, 7; (Problems) 11, 21, 27, 29, 37

DELA 6.2 Constant coefficients homogeneous equations: (T/F review) 2, 6, 7; (Problems) 5, 11, 17, 33, 40

DELA 6.3 Undetermined coefficients: (T/F review) 2, 3, 6; (Problems) 9, 17, 23, 35

DELA 6.4 Complex valued test functions: (T/F review) 1, 2, 5; (Problems) 4, 5, 7, 11

DELA 6.5 Spring-mass systems and oscillations: (T/F review) 3, 4, 8; (Problems) 5, 13, 15, 23, 26

DELA 6.7 Variation of parameters (optional): (T/F review) 1, 2; (Problems) 1, 10, 25

DELA 6.8 Cauchy-Euler equations (optional): (T/F review) 2, 4, 5; (Problems) 7, 11, 16, 21

DELA 6.9 Reduction of order: (Problems) 2, 5, 8, 11, 15

(3) Systems of linear ODE, 4 weeks

DELA 7.1 First order linear systems: (T/F review) 3, 5, 8; (Problems) 5, 9, 11, 15, 18, 20
DELA 7.2 Vector form of linear systems: (T/F review) 2, 5, 6; (Problems) 5, 7, 12, 13

DELA 7.3 Fundamental solutions: (T/F review) 1, 3; (Problems) 1, 2, 5, 7

DELA 7.4 Systems with simple eigenvalues: (T/F review) 2, 4, 5; (Problems) 6, 17, 19, 20, 23, 26

DELA 7.5 Systems with multiple eigenvalues: (T/F review) 1, 2, 4; (Problems) 7, 15, 16, 17

DELA 7.8 Matrix exponential solutions (optional): (T/F review) 2, 3, 5; (Problems) 3, 6, 10, 11

DELA 7.9 Autonomous systems and phase plane analysis: (T/F review) 1, 3, 4; (Problems) 11, 17, 20, 23,

DELA 7.10 Nonlinear systems: (T/F review) 1, 3, 4; (Problems) 1, 6, 9