

Course Schedule
Chemical Engineering 231
Mathematical Modeling
Spring 2019

Date	Lecture Topic	Reading	Due
1/22	Introduction	Lecture notes	
1/23	MATLAB: Introduction	Lecture notes	
1/24	Probability	Sections 24.1–24.3	
1/29	Probability distributions	Sections 24.5, 24.6	Written #1
1/30	MATLAB: Manipulating data	Lecture notes	
1/31	Binomial & normal distributions	Sections 24.7, 24.8	
2/5	Confidence intervals	Sections 25.1–25.3	Written #2
2/6	MATLAB: Functions	Lecture notes	
2/7	Hypothesis testing	Section 25.4	
2/12	Correlation & regression analysis	Section 25.7	Written #3
2/13	MATLAB: Statistics toolbox	Lecture notes	
2/14	Experimental design	Lecture notes	
2/19	MONDAY SCHEDULE		
2/20	MATLAB: Statistics	Lecture notes	
2/21	Linear algebra	Sections 7.1, 7.2	MATLAB #1
2/26	MIDTERM EXAM #1		
2/27	MATLAB: Program control	Lecture notes	
2/28	Gauss elimination	Sections 7.3, 7.4, 20.1	
3/5	Matrix inverse	Sections 7.5, 7.6, 7.8	Written #4
3/6	NO CLASS		
3/7	NO CLASS		
3/12–3/14	SPRING BREAK		
3/19	Ill-conditioned matrices	Section 20.4	
3/20	MATLAB: Matrix calculations	Lecture notes	
3/21	Least-squares problems	Section 20.5	
3/26	Eigenvalues & eigenvectors	Sections 8.1, 8.4	Written #5
3/27	MATLAB: Linear algebraic systems	Lecture notes	
3/28	Nonlinear algebraic equations	Section 19.2	
4/2	Newtown-Raphson method	Lecture notes	Written #6
4/3	MATLAB: Nonlinear algebraic equations	Lecture notes	
4/4	Formulating ODE models	Sections 1.1, 1.2	
4/9	Linear ODE systems	Sections 4.1–4.3	MATLAB #2
4/10	ODE system stability	Sections 4.4, 4.5	
4/11	MIDTERM EXAM #2		
4/16	Numerical differentiation	Sections 21.1, 2.2	Written #7
4/17	MONDAY SCHEDULE		
4/18	Numerical solution of ODEs	Sections 21.1, 2.2	
4/23	Numerical solution of ODE systems	Section 21.3	
4/24	MATLAB: Nonlinear ODEs	Lecture notes	MATLAB #3
4/25	Boundary value ODEs	Lecture notes	
4/26	Differential-algebraic equation systems	Lecture notes	
5/1	MATLAB: Linear ODEs	Lecture notes	Project