MATH 451: Mathematical Modeling

Course Schedule – Fall 2026

Dr. Shalmali Bandyopadhyay
MWF 1:00–1:50 PM, Latimer-Smith 304
University of Tennessee at Martin

Module 1: Modeling Change

Day	Date	Topic	Due
1	Mon Aug 24	Introduction / Syllabus	

Module 2: The Modeling Process, Proportionality, and Geometric Similarity

Day	Date	Topic	Due
2	Wed Aug 26	The Modeling Process	
3	Fri Aug 28	Mathematical Models	
4	Mon Aug 31	Modeling Using Proportionality	
5	Wed Sep 2	Modeling Using Geometric Similarity	**HW 1 due**
6	Fri Sep 4	Automobile Gasoline Mileage / Body Weight and Height	**HW 2 due**
	Mon Sep 7	*Labor Day – No Class*	

Module 3: Dimensional Analysis and Similitude

Day	Date	Topic	Due
7	Wed Sep 9	Dimensions as Products / Process of Dimensional Analysis	**HW 3 due**
8	Fri Sep 11	A Damped Pendulum / Examples	
9	Mon Sep 14	Similitude	**HW 4 due**
10	**Wed Sep 16**	**Exam 1 (Ch 1, 2, 14)**	
11	Fri Sep 18	Project 1 – Day 1	
12	Mon Sep 21	Project 1 – Day 2	
13	Wed Sep 23	Project 1 – Day 3	

Project 1 Report due: Friday, September 25

Module 4: Modeling Topic I – Discrete Optimization

Day	Date	Topic	Due
14	Fri Sep 25	Modeling Change with Difference Equations	
15	Mon Sep 28	Approximating Change with Difference Equations	
16	Wed Sep 30	Solutions to Dynamical Systems	**HW 5 due**
17	Fri Oct 2	Systems of Difference Equations	
18	Mon Oct 5	Optimization Introduction / Overview	**HW 6 due**
19	Wed Oct 7	Linear Programming – Geometric Solution	
20	Fri Oct 9	Linear Programming – Algebraic Solution	**HW 7 due**
	Mon Oct 12	*Fall Break – No Class*	
21	Wed Oct 14	Linear Programming – Simplex Method	
22	Fri Oct 16	Linear Programming – Sensitivity Analysis	**HW 8 due**
23	**Mon Oct 19**	**Exam 2 (Difference Equations, Linear Programming)**	
24	Wed Oct 21	Project 2 – Day 1	
25	Fri Oct 23	Project 2 – Day 2	
26	Mon Oct 26	Project 2 – Day 3	
27	Wed Oct 28	Project 2 – Day 4	

Project 2 Report due: Friday, October 30

Module 5: Modeling Topic II – Game Theory

Day	Date	Topic	Due
28	Fri Oct 30	Decision Theory Introduction	
29	Mon Nov 2	Probability and Expected Value	
30	Wed Nov 4	Decision Trees	**HW 9 due**
31	Fri Nov 6	Sequential Decisions and Conditional Probabilities	
32	Mon Nov 9	Game Theory Introduction / Total Conflict	**HW 10 due**
33	Wed Nov 11	Total Conflict as a Linear Program Model	
34	Fri Nov 13	Games Against Nature / Pure Strategy	**HW 11 due**
35	Mon Nov 16	2×2 Total Conflict Game / Partial Conflict	
36	Wed Nov 18	Partial Conflict Games / Illustrative Example	**HW 12 due**
37	**Fri Nov 20**	**Exam 3 (Decision Theory, Game Theory)**	
38	Mon Nov 23	Project 3 – Day 1	**HW 13 due**
	Wed Nov 25	*Thanksgiving – No Class*	
	Fri Nov 27	*Thanksgiving – No Class*	
39	Mon Nov 30	Project 3 – Day 2	
40	Wed Dec 2	Project 3 – Day 3	
41	Fri Dec 4	Project 3 – Day 4	

Project 3 Report due: Friday, December 4

Final Exam

Date	Time	Location
Monday, December 7	**12:45–2:45 PM**	**LS 304**