Math 425  Mathematical Modeling (4 semester hours)

Course Description:
This course presents topics from mathematical analysis of both discrete and continuous models taken from problems in the natural sciences, economics and resource management.

Prerequisites: MATH 223 and MATH 247 with “C” (2.0) or better or consent

Learning Outcomes:
Students will be able to

1. Formulate applied problems and natural phenomena as mathematical models
2. Analyze and interpret the model through mathematical analysis
3. Simulate the model and forecast the phenomena by using a computer
4. Recognize usefulness of mathematical knowledge in solving real world problems

Course Content:

1. Continuous dynamic modeling and analysis
2. Discrete dynamic modeling and analysis
3. Probabilistic and stochastic modeling
4. Spatiotemporal modeling and pattern formation
5. Simulation modeling and model validation

Textbook/Related Readings/Materials:

C. C. Lin and L.A. Segel, Mathematics Applied to Deterministic Problems in the Natural Sciences
B. Barnes and G. Fulford, Mathematical Modeling with Case Studies
L. Edelstein-Keshet, Mathematical Models in Biology
F. R. Giordano, et al. , A First Course in Mathematical Modeling