Spring 2021

APM 534 – Mathematical Population Biology 2

Instructor: Fabio Milner

Time: 1:30-2:45 pm, Tuesday & Thursday

Location: WXLR 109

Contact: 480-965-4522; milner@asu.edu

Office Hours: Monday & Thursday 10:00-11:00, and by appointment

Schedule Line #: 25451

Credits: 3

Course Description from ASU Catalog: Selectively covers population biology models in the form of partial differential equations and systems. Focuses on mathematical analysis of population models as well as model formulation and simulation. Students should have a previous basic graduate-level course in ODE and PDE.

Textbook: M. Iannelli, F. Milner, The Basic Approach to Age-Structured Population Dynamics (Springer, New York, 2017). DOI: 10.1007/978-94-024-1146-1

Topics: The course will be focused on PDE population models that include one or more ages as a structure variables. Example models will be discussed from demography, ecology and epidemics, and both analytical results and model fitting to real-life data will be provided. Significant portions of chapters 1, 2, 4, 5, 6 and 8 from the textbook will be covered, including the basic theory for linear models—autonomous and non-autonomous—as well as nonlinear models and stability of equilibrium solutions. Time-permitting, numerical methods for simulations using the models will be discussed, as well as global behavior of solutions.

Grading: There will be one midterm and one final exam (non-comprehensive), each worth 40% of the course grade, and homework assignments worth 20% of the grade. The grading scale will be the standard one: A+ = [97,100]; A = [93,97); A- = [90,93); B+ = [87,90); B = [83,87); B- = [80,83); C+ = [77,80); C = [70,77); D = [60,70); E = [0,60).