

Fall 2011

Posted March 2011

AERO 540 (ME 540) [Bernstein]

AERO 550 (EECS 560)(ME 564) [Kabamba]

EECS 418 (Power Electronics)[Hoffman or new faculty]

EECS 460 [Grizzle]

EECS 461 [Freudenberg]

EECS 463 (Power System Design and Operation)[Hiskens]

EECS 501 [Winick]

EECS 558 [Teneketzis]

EECS 560 (AERO 550) (ME 564) [Kabamba]

EECS 569 (Production Systems)[Meerkov]

ME 552 [Awtar]

ME 553 (MFG 553) [Chronis]

ME 560 [Stein]

ME 563 (Time Series Analysis)[TBA]

ME 568 [Ulsoy]

ME 599 (Fuel Cell Systems)[Siegel-Stefanopoulou]

NA490 (Marine Control Systems)[Sun]

Math 550/CSCS 510: Adaptive Dynamics: The Mathematics of Sustainability

Time: Fall 2011 Mon-Wed 2:30-4 (Optional Intro to Diff. Equations: Fri Sep 9, 3-6)

Overview: Sustainability has become a key issue in research and teaching at The University of Michigan. In Fall 2011, Math 550/CSC 510 will present a systems-based and in-depth examination of the mathematical foundations behind the sustainability of renewable (fish, forests, fauna) and nonrenewable (oil, gas, coal) resources. Since change, resilience to change, evolution, optimality, and trade-offs are central issues in sustainability, focal topics of this course will be the theory and applications of dynamical systems, optimal control theory and game theory. Our systems approach to sustainability will include quite a bit of ecology and economics. Students will use Excel spreadsheets for more complex computations.

Prerequisites: Four semesters of calculus (especially familiarity with differential equations), or permission of instructor. There will be an optional 3-hour overview of the fundamentals of difference and differential equations Friday, September 9, 3-6pm. Students of ecology, economics, natural resources, bioengineering, and bioinformatics – with the appropriate math background --are especially welcome.

Grading: Two exams, a final and lots of homework.

Texts: Colin Clark: *Mathematical Bioeconomics*, THIRD EDITION (Wiley, 2010). Jon Conrad, *Resource Economics*. SECOND EDITION. (Cambridge, 2010). Lots of C-Tools Readings.