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Cooperative Systems Course: The Mathematics of Harmony.

The Cooperative Systems course connects various modeling methodologies and perspectives across mathematics and other disciplines to build a framework for humanistic/social problem solving involving cooperative entities. This presentation describes the elements of a new undergraduate mathematics course that involves innovative study to understand the utility and effectiveness of adaptive intelligent (cooperative) systems. This course looks at dynamic complex systems and networks that replace centralized organization or control with distributed cooperation (component collaboration) through the development of structures and processes for communicating, adapting, learning, reasoning, governing, organizing, and decision-making by people in the system. Most of the material is learned through studying, engaging, modeling and solving current, complex, capacious social problems and public issues. The major objectives of the course are to understand the mathematics and science of human thought, enjoyment, and problem solving through harmony in intelligent cooperation, learning, pattern analysis, decision-making, and cognition. (Received August 11, 2010)