# FALL 2013
# Computer Science
# Special Topics

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## CS 491-1 / CS 591-1

Tuesday & Thursday
3:35 – 4:50 p.m.
Pulliam 34

Instructor - Dr. Henry Hexmoor

## Network Theory

That we are surrounded by natural and man-made networks is self-evident. Foundations phenomena of networks will be explored both qualitatively and quantitatively. We will review reasoning, migration, diffusion, and games over networks. Dynamic processes such as percolation will be among our discussion topics. The course will incorporate game theory with network theory. Networks can be used as tools to develop microcosmic models to explore and predict issues spanning multiple disciplines including Economy, Politics, Society, Biology, and Engineering. We will explore the capacities of these models over networks in the small to extrapolate to issues of interest in networks in the large. We may use existing software package such as ucinet, pajek, and nodeXL; however, emphasis will be to write our own programs applied to our own networks.

The course will offer skills to (a) explain natural and collective phenomena in online networks and cyberspace, and (b) understand and design network policies to produce desirable effects.

**Prerequisite:** CS 330 with a grade of "C" or better or **approval of instructor.**
**Target Audience:** SIU CS department upper division and the academic public at corresponding levels.
**Textbook:** D. Easly, J. Kleinberg, 2010. Networks, Crowds, and Markets, Cambridge University press.
**Recommended book:** M. Newman, 2010. Networks: An Introduction, Oxford University Press.