INTEG 475 — Special Topics: Evidence-Based Decision Making, (WINTER 2016)
(held with ERS 475/675, GEOG 474/675; LEC, SEM)

Overview: Everyday, decisions are made at a personal level, an organizational level, or in the form of public policy. This course introduces decision analytic tools for systematically structuring messy problems to identify trade-offs among different decisions and how to explore them intelligibly. The limits of evidence-based approaches for effective decisions will also be discussed, such as the is-ought problem, the threat of undemocratic technocracy, and the complexities of policy cycles.

Meeting time: TBD, but at two 80-minute blocks per week
Instructor: Vanessa Schweizer, EV1-211, vanessa.schweizer@uwaterloo.ca

Objectives: By the end of this course, you should be able to
1) Articulate the difference between inquiries that aim to uncover facts (science) from decisions (value debates, policy, legal judgments).
2) Explain the complementary relationship that science can play to policy and its importance (i.e. policy-relevant science, science-policy interface, science-society interface)
3) Apply a variety of decision-analytic techniques for the purposes of problem definition and policy evaluation
4) Construct and analyze a simple model for a policy problem, where you are able to
   ○ Recommend at least one intervention that should be pursued (or avoided) and why;
   ○ Perform an appropriate sensitivity analysis of your results;
   ○ Discuss the limitations of your simple model and important considerations for a decision or for future research.

Potential text(s):
• *Making Hard Decisions* by Robert T. Clemen, 1997 or 2004
• *Numbersight: A Street-Fighting Mathematician Teaches How to Make Better Decisions* by Sanjoy Mahajan, 2015

Potential required software:
• Microsoft Excel and latest appropriate Add-ins (e.g. TreePlan)
• Analytica by Lumina Decision Systems
• The latest version of ScenarioWizard by Wolfgang Weimer-Jehle
• STELLA by isee systems

Selected readings may be drawn from the following books:
• *The Structure of Scientific Revolutions* by Thomas S. Kuhn
• *The Honest Broker* by Roger Pielke Jr., 2007
• *Uncertainty* by M. Granger Morgan and Max Henrion, 1990
• *Thinking, Fast and Slow* by Daniel Kahneman, 2013
• *Science as a Contact Sport* by Stephen Schneider, 2009
• *A More Beautiful Question* by Warren Berger, 2014
• *Implementation: How Great Expectations in Washington are Dashed in Oakland; Or, Why It’s Amazing that Federal Programs Work at All, This Being a Saga of the Economic Development Administration as Told by Two Sympathetic Observers Who Seek to Build Morals on a Foundation of Ruined Hopes* by Jeffrey L. Pressman & Aaron Wildavsky, 1973

**Potential papers for readings**
• Alvin Weinberg on Trans-science
• Funtowicz and Ravetz on Post-normal science
• Paul Slovic on affect and risk perception
• Matthew Brown on Deweyan inquiry
• Cohen et al., “A Garbage Can Model of Organizational Choice”