Advanced Decision Analysis

Sample Course Syllabus

Core Faculty: Ron Howard

This course is taught by the Socratic method – guided, but unfettered by an instruction plan. Important concepts are introduced when they arise in the discourse and therefore at the peak of interest. This open format allows pursuit of a topic to an appropriately satisfying conclusion rather than cutting off discussion summarily at the end of a session.

Auctions and Bidding
What is the best strategy in a bidding situation? How does this strategy depend upon the auction type? Why do winners sometimes lose? Professor Howard demonstrates how decision analysis brings clarity of action to complex, highly-competitive auctions.

Gathering Information
How much is it worth to gather additional information before making a choice? Professor Howard explains how decision diagrams can be used to represent information gathering opportunities, such as market research or testing programs.

Framing
Perhaps the single most important decision-making mistake is obtaining an excellent answer to a different problem. Before we can analyze our choices, we must frame the decision appropriately. Professor Howard introduces the concepts of decision quality and the decision hierarchy. These concepts and their associated tools ensure that our efforts are focused in the right direction.

Probability Assessment
High-quality decision analyses require high-quality probabilistic assessments. How good are we at probability assessment, and how can we improve our performance? Professor Howard demonstrates the pitfalls of probability assessment and how to overcome them.

Assessment Quality
Professor Howard demonstrates careful modeling through the use of knowledge maps and systematic assessment procedures.

Advanced Risk Preference
How do we incorporate risk aversion into our decision-making procedures? How risk averse should you be? How about your company? Professor Howard expands upon the risk preference modeling introduced during the Decision Analysis course to more directly tie risk preference to wealth. In addition, he discusses the history of risk preference modeling and demonstrates its use.
Exploring Preference
How do we incorporate time and risk preference? How do we account for multiple value measures? Professor Howard demonstrates how to account for joint time-risk preference and how the concept of dominance can simplify decision analyses. In addition, he introduces the concept of direct and indirect values, which brings clarity when trying to achieve multiple objectives.

Advanced Information Gathering
Suppose we face multiple information gathering opportunities or tests. How do we choose the best single test or combination of tests? Professor Howard shows how to model multi-testing situations and demonstrates the effect of relevance between tests.

Options
Most decision situations include downstream contingencies or future decision opportunities. How do we model and value such “options?” Professor Howard discusses the fundamental importance of options in decision analyses. He argues that our failure to include options in some decision analyses greatly reduces decision quality.

Risk Scaling and Sharing
Suppose you face an investment that is too large for you individually, but you can form a syndicate comprised of other individuals who will purchase and share the investment. How should the syndicate be structured? What is your optimal share? Professor Howard demonstrates how decision analysis can be used to optimally structure joint investments or partnerships.

Integration
The course concludes with a series of experiential exercises that unify understanding of key concepts.