<u>Approval: 4th Senate Meeting</u>

Course Name   : Managerial Decision Making
Course Number   : CS-603
Credits   : 3-0-0-3
Prerequisites   : IC 210 Probability, Statistics and Random Processes; or, with instructor's permission
Intended for   : 3rd, 4th year B. Tech./M.S./Ph.D.
Distribution   : Discipline-elective forCSE B. Tech. students; Free elective for other B. Tech./M.S./Ph.D. students
Semester   : Odd, Even

Preamble: This course builds upon topics covered in CS courses like Artificial Intelligence and Advanced Data Structures and Algorithms and provides the theory and applications of computer science to decision making in managerial settings. It provides a template of what to avoid and what to do when students are involved in managerial decisions in their future careers. This course emphasizes the role of uncertainty as a critical component in influencing our day-to-day decisions. In addition, it forms one of the basket courses of a minor in public management.

Course Outline: The objective of this course is to teach students to make better decisions. People in organizations make decisions, with important consequences, every day. This is especially true of people in the role of engineers and managers. Therefore, an understanding of decision-making is an important component of any complete education in engineering and management. There are other courses on decision making (for instance, Judgment and Decision Making, Behavioral Decision Making). However, this course specifically focuses on how to make decisions in real-world (and particularly, managerial) situations. Therefore, rather than focusing exclusively on the normative theory of how to make decisions or on the descriptive science of how people make decisions, we will try to focus on how real people, such as managers, make real decisions. Most of the students will someday occupy positions with some kind of managerial discretion. In order to make good decisions it is important that students start learning and practicing tools for decision making at an early stage.

Modules:

Module 1: Introduction to decision making   (6 hours)
Orientation, introduction to decision making, Introduction to decision analysis, framing decisions, applications of decisions framing to marketing and management.

Module 2: Valuation and choice in certain and uncertain decision situations   (6 hours)
Valuing and choosing among certain outcomes, valuing and choosing among uncertain outcomes, applications of decision trees to decision making.

Module 3: Use of heuristics and biases   (10 hours)
Introduction to different heuristics and biases, endowment effect, loss aversion, status quo bias, inter-temporal biases, other common biases in decision making under risk and uncertainty

Module 4: Real-world managerial decision making   (8 hours)
Decisions under uncertainty in the real world, managerial perspectives on risk and risk taking, regression analysis, improper linear models in decision making, when to trust your gut instincts, theory of thin slices.

Module 5: More biases and heuristics under risk and uncertainty   (6 hours)
Availability, representativeness, anchoring-and-adjustment, illusion of control, confirmation bias.

Module 6: Decision making in groups   (6 hours)
Decision making in groups and organizations, cognitive repairs, nudges, conclusions.

Textbooks:

J. Edward Russo & Paul Schoemaker. Winning Decisions: Getting it Right the First Time. 2002. New York: Doubleday. [RS]
John S. Hammond, Ralph L. Keeney, & Howard Raiffa. Smart Choices: A Practical Guide to Making Better Decisions. 1999. Boston: Harvard Business School Press. [HKR]

Articles:

JSTOR: Articles are available from www.jstor.org (accessible through any IIT computer).
HBS-online: Cases, articles, and teaching notes from Harvard Business School Press are available from http://harvardbusinessonline.hbsp.harvard.edu. I will hand out photocopies during the semester.