A critical determinant of success for individuals and organizations is making good decisions. But why is it that we don’t always make rational and logical choices? How can we improve the quality of our judgments and choices? To address these questions, the course will review:

- strategies for making rational choices;
- the psychology of judgment and decision making, including the roles of thinking strategies known as heuristics; and
- quantitative techniques for decision making, including optimization/linear programming and classification tree models.

Learning Outcomes
After completing this course you will be able to:
- Use decision analysis to facilitate rational choice
- Recognize different descriptive judgment and decision-making strategies
- Solve an optimization problem
- Use classification models to inform decision making

The Pre-requisites for this course are: MATH 115 Precalculus, AND STAT 100 Elementary Statistics and Probability, AND PSYC 100 Introduction to Psychology, AND INST 314 Statistics for Information Science.

Required Resources
The following resources are necessary for you to successfully complete this course.

- The course website, [www.elms.umd.edu](http://www.elms.umd.edu)
- One text book:
Completing the required readings is essential to understanding the course material.

**Required Software**
The following software is necessary for you to successfully complete the course.
Microsoft Excel. For Macintosh users it is available through the university’s TERPware website ([https://terpware.umd.edu](https://terpware.umd.edu)).
R software. It is free and available online ([https://www.r-project.org/](https://www.r-project.org/)). You may want to use R Studio (the free version), which is an integrated development environment for R ([https://www.rstudio.com/](https://www.rstudio.com/)).

**Campus Policies**
Please visit [http://www.ugst.umd.edu/course RELATEDPOLICIES.html](http://www.ugst.umd.edu/course RELATEDPOLICIES.html) for the Office of Undergraduate Studies’ full list of course related policies and follow up with me if you have questions. It is our shared responsibility to abide by the University of Maryland’s policies.

**Academic Integrity** – Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. Thus, it is important that you complete your own work on the assignments and exams. Please visit [http://osc.umd.edu/OSC/Default.aspx](http://osc.umd.edu/OSC/Default.aspx) for more information about academic integrity.

**Special Needs** — Students with disabilities should inform me of their needs at the beginning of the semester. Please also contact the Disability Support Services (301-314-7682 or [www.counseling.umd.edu/DSS](http://www.counseling.umd.edu/DSS)). DSS will make arrangements with you and me to determine and implement appropriate academic accommodations. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or [www.counseling.umd.edu](http://www.counseling.umd.edu)) for expert help.
Learning Assessments

**Discussion Forum Participation (15%)**: Participation is a vital component of this course. You are expected to participate by posting to a weekly discussion forum. You will be asked to respond to a discussion question that I post about the readings. Your post is due by 11:59 PM on Sundays. There will be no discussion forums on the weeks that exercises are due.

**Exercises (40%)**: There will be four exercises. Each exercise will be graded on a scale of 0-10. You may work with your colleagues to figure out the underlying concepts and problem-solving processes, but are expected to work individually to answer the specific problems that are assigned. Completed assignments will be submitted via Canvas/ELMS. They are to be submitted by 11:59 PM on the day that they are due. Due dates are indicated below under “Course Schedule.”

The day before each exercise is due, I will create an “Instructor Discussion” forum. You may post questions about the exercises for me to answer. Participation in this discussion forum is optional.

**Quizzes (30%)**: There will be four short quizzes to test your understanding of the concepts covered in the readings and lectures. They will be open book and open notes. We will drop your poorest quiz and the remaining 3 quizzes make up 30% of your grade. They are to be submitted by 11:59 PM on the day that they are due. Dates for each quiz are indicated below under “Course Schedule.”

**Case Study Report (15%)**: You will write a report in response to a case study about a decision that an individual or organization must make. The project deliverable is a written report (2-3 pages double-spaced). It should not exceed 1,000 words of text, excluding figures, tables, references, and appendices.

**Letter Grades**
Final letter grades are assigned based on the percentage of total assessment points earned. To be fair to everyone I have to establish clear standards and apply them consistently, so please understand that being close to a cutoff is not the same thing as crossing it (89.9 ≠ 90.0). It would be unfair to make exceptions for some and not others.

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**Course Schedule**

‘R-1”, “R-2”,… “R-5” refer to assigned readings that are shown below under “Readings.”

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<tr>
<th>Wk</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 28-Feb1</td>
<td>Introduction and Course Overview; What is a “Decision”?</td>
<td>RC Chapter 1</td>
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<td></td>
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<td>RC Chapter 2, p 23-26</td>
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<td><strong>Discussion Forum 1</strong></td>
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<td><strong>Module 1: Decision Analysis</strong></td>
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<td>2</td>
<td>Feb 4-8</td>
<td>What is Decision Analysis?; Payoff Matrix</td>
<td>R-1 (1st half: p 803-817)</td>
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<td>R-2 (p 736 – 751)</td>
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<td><strong>Discussion Forum 2</strong></td>
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<td>3</td>
<td>Feb 11-15</td>
<td>Decision Trees</td>
<td>RC Chapter 2, p 26-32</td>
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<td>R-2 (p 751 – 753)</td>
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<td>R-3</td>
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<td>Feb 18-22</td>
<td>Decision Trees cont.</td>
<td>R-2 (p 759 – 775)</td>
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<td><strong>Discussion Forum 4</strong></td>
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<td>Exercise 1 and Quiz 1 posted on Feb 24</td>
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<td>5</td>
<td>Feb 25 – March 1</td>
<td>Considerations/Pitfalls in Decision Analysis</td>
<td>RC Chapter 2, p 32-42</td>
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<td>R4</td>
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<td>R5</td>
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<td><strong>Quiz #1 (due Thur Feb 28 by 11:59 PM)</strong></td>
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<td><strong>Exercise #1 (due Sun Mar 3 by 11:59 PM)</strong></td>
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<td><strong>Module 2: Decision Theories</strong></td>
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<td>6</td>
<td>Mar 4 - 8</td>
<td>Utility Theory; Prospect Theory; and DecisionWeights</td>
<td>R-6</td>
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<td>RC Chapter 11, p 237-241</td>
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<td>RC Chapter 12</td>
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<td><strong>Discussion Forum 5</strong></td>
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<td>7</td>
<td>Mar 11 - 15</td>
<td>Automatic vs. Controlled Thinking</td>
<td>R-7</td>
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<td>Exercise 2 and Quiz 2 posted on Mar 17</td>
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<td><strong>Discussion Forum 6</strong></td>
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**Module 3: Mathematical Techniques to Inform Decisions**

Mar 25 - 29  Heuristics
Readings:
RC Chapter 4
RC Chapter 5

Quiz #2 (due Thur Mar 28 by 11:59 PM)
Exercise #2 (due Sun Mar 31 by 11:59 PM)

**Module 4: Statistical Models to Inform Decisions**

Apr 1-5  Optimization/Linear Programming
Readings:
R-8
Discussion Forum 7

Apr 8-12  *Solving Optimization Problems in a Spreadsheet*
Video:
https://goo.gl/AFcC7V
Readings:
R-9
R-10
R-11
Discussion Forum 8
Exercise 3 and Quiz 3 posted on Apr 14

Apr 15-19  *Sensitivity Analysis*
Readings:
R-12
Quiz #3 (due Thur Apr 18 by 11:59 PM)
Exercise #3 (due Sun Apr 21 by 11:59 PM)

Apr 22-26  Statistical Modeling; Data-Driven Decision Making; Models vs. Human Judgment
Readings: R-13, R-14
Discussion Forum 9
13 Apr 29 - May 3  Classification and Decision Tree Models
Readings:
R-15

Discussion Forum 10
Exercise 4, Quiz 4, and Case Study assignment posted on May 5

14 May 6 - May 10  Classification and Decision Tree Models cont.
Quiz #4 (due Thur May 9 by 11:59 PM)
Exercise #4 (due Sun May 12 by 11:59 PM)
Case Study Report (due Sun May 19 by 11:59 PM)

If there are updates to the schedule, they will be posted to ELMS/Canvas.

Readings (available on ELMS/Canvas if a URL is not provided)