EST 581 Decision-making in Technology Settings  
Fall 2021  
Physics P113 6:05-9:00  
Lecture: 6:05-6:45 Discussion-Algorithm 6:50-7:50 “Group” Work 8:00-9:00  

Instructor: David Tonjes  
1427 (old) Computer Science  
631-632-8518  
Email: david.tonjes@stonybrook.edu  
Office Hours: M 1-2:30, 4-5:30  
On campus typically M, T, Th

Prerequisites: none  

Credits: 3

The selection, adoption, adaptation, and abandonment of technologies requires making explicit choices. These choices may be made by one decision-maker or be the result of many persons’ inputs. Decisions may be made through quantitative comparisons across one or several dimensions or may be the product of a less well-defined process. This course will examine decision making through cost-benefit and risk analyses, multi-criteria decision-analysis techniques such as the analytic hierarchy process, and modern concepts regarding heuristics, both from the perspective of a lone decision-maker and in settings where many have a role in reaching the decision.

Learning Outcomes:
1. Use multiple quantitative decision-making techniques  
2. Analyze the role of bias in judgements  
3. Reflect on the benefits associated with structured group processes

Required text: There are no required books to purchase for this class.

Read by the Midterm (October 5):  


Many papers will be posted in BlackBoard for you to read for particular classes. See the “Materials” tab.
Grading:
Attendance 10%
Readings 10%
Homework 10%
Midterm 20%
Project 50%

Grades:
A = 90+   A- = 85-89   B+ = 80-84   B = 70-79   B- = 65-69   C = 60-64   F = < 60

Attendance:
In class activities are important so attendance will be taken.

Readings:
1 page summary of every reading assignment required by Sunday at midnight. Sclove & O’Grady readings summary required by October 5

Homework:
Individual submissions due Sundays at midnight
A number of video supplements will be posted on BlackBoard that will review algorithms needed to complete the homeworks.

Midterm
Take-home. Do not collaborate. Assigned October 4, due October 18 class time through BlackBoard.

Project Due Monday December 13
Two choices:
1) Select a technologically-related decision area. Outline the choices involved. Provide information to drive the use of a decision-making technique used in class. Use quantitative methods to select the best choice.
2) Assume you need a new phone. Thoroughly examine the choices available to you and justify a selection. Short-term and long-term aspects of the decision need to be addressed. Understand that since this is a familiar action for many the submission needs to be very complete and very serious. You must apply aspects of the course to earn a good score.

Plagiarism
Plagiarism is presenting someone else’s work as your own. It consists of copying, intellectual property theft, and unauthorized collaboration. Do not copy material from the web or other sources for homework, exams, presentations, papers, etc., without properly citing. Do not use someone else’s ideas or work without sufficient attribution (be careful and record “who, what, and where” when researching) (find examples from professional research work for referencing and use that) (do not cite generic websites – www.wikipedia.org – as that is a meaningless reference). Do not work with someone else if the work is supposed to be your own.

All plagiarized submissions will be scored as 0. Plagiarism has resulted in failing this class, and even in dismissal from graduate school.
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<tr>
<th>Class</th>
<th>Lecture Topic</th>
<th>Class discussion-algorithm</th>
<th>Group Work</th>
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<th>Reading Assignment (for next class)</th>
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<td>1.</td>
<td>Univariate decisions</td>
<td>Syllabus review</td>
<td>Decision examples</td>
<td>#1</td>
<td>Tversky &amp; Kahneman 1974; Giraldeau 2011</td>
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<td>2.</td>
<td>Rationality; Heuristics</td>
<td>Value of heuristics</td>
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<td>Labor Day 9/6 No class</td>
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<td>Stevens 1946</td>
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<td>3.</td>
<td>Quantitative assessment of qualitative characteristics</td>
<td>SMART</td>
<td>SMART problem</td>
<td>#2</td>
<td>Carpi &amp; Eggers 2008; Erickson 2019</td>
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<td>4.</td>
<td>Error and uncertainty</td>
<td>Expected Monetary Value</td>
<td>EMV #1, EMV #2</td>
<td>#3</td>
<td>Fehr-Duda and Fehr 2016; Szpiro 2013</td>
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<td>6.</td>
<td>Decision Trees</td>
<td>Decision tree construction</td>
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<td>#5</td>
<td>Sclove &amp; O’Grady papers summary due Midterm Assigned</td>
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<td>10/11 Fall Break No Class (Midterm)</td>
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<td>Pilkey 2008; Sraders 2019</td>
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<td>9.</td>
<td>LCAs</td>
<td>Toffel &amp; Horvath</td>
<td>Paper or plastics?</td>
<td>Greene and Tonjes 2014</td>
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<td>10.</td>
<td>MCDA algorithms, Pareto curve</td>
<td>Athey method</td>
<td>Athey problem</td>
<td>Saaty 1988</td>
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<td>11.</td>
<td>AHP</td>
<td>AHP how-to</td>
<td>AHP problem</td>
<td>#7</td>
<td>Sanfey, 2007; Stanford, 2019; Kahneman et al. 2021</td>
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<td>12.</td>
<td>Negotiation (game theory)</td>
<td>Negotiation discussion</td>
<td>Data noise, decision noise</td>
<td>Prelec et al. 2017; Sutherland and Burgman 2015; Madhavan et al. 2017; Brams 2011</td>
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<td>14.</td>
<td>Bias</td>
<td>Bias discussion</td>
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<td>Take implicit bias test</td>
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<td>Week of 12/13 No class Project Due 12/13</td>
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Readings list:
DISABILITY SUPPORT SERVICES (DSS) STATEMENT
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities

CRITICAL INCIDENT MANAGEMENT:
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

ACADEMIC INTEGRITY
Intellectual honesty is the cornerstone of all academic and scholarly work. Therefore, the University views any form of academic or scholarly dishonesty as a serious matter. Instructors are required to report all allegations of academic or scholarly dishonesty to their Graduate Program Director and the student’s home Graduate Program Director if different. Furthermore, Graduate Program Directors must report all incidents in which a student is found guilty to the Graduate School. Additional details on procedures for hearings and other functions at the judiciary processes are available in the Grievances and Appeals section of the Bulletin (http://sb.cc.stonybrook.edu/gradbulletin/current/regulations/academic_probation/appeals.php)