Decision Making and Rationality Concentration

Symbolic Systems majors completing the new Core requirements effective for 2020-2021 must complete the following requirements to qualify for a Concentration in Decision Making and Rationality. All courses must be taken for 3 units of more. Notes: Core requirements fulfilled by a course are noted in brackets "[]". "ASSR" denotes courses that fulfill the Advanced Small Seminar Requirement.

1. **Philosophical Inquiry.** One of the following:
   - MS&E 234: Data Privacy and Ethics
   - MS&E 254: The Ethical Analyst
   - MS&E 299: Voluntary Social Systems
   - PHIL 164: Central Topics in the Philosophy of Science: Theory and Evidence (PHIL 264) [*Introductory Philosophy*]
   - PHIL 166: Probability: Ten Great Ideas About Chance (PHIL 266, STATS 167, STATS 267) [*Introductory Philosophy*]
   - PHIL 169: Evolution of the Social Contract (PHIL 269) [ASSR]
   - PHIL 170: Ethical Theory (ETHICSOC 170, PHIL 270) [*Introductory Philosophy*]
   - PHIL 171: Justice (ETHICSOC 171, IPS 208, PHIL 271, POLISCI 3P, POLISCI 136S, POLISCI 336S, PUBLPOL 103C, PUBLPOL 307) [*Introductory Philosophy*]
   - PHIL 172: History of Modern Moral Philosophy (PHIL 272) [*Introductory Philosophy*]
   - PHIL 184: Formal and Informal Epistemology (PHIL 284) [Advanced Philosophy]
   - PHIL 187: Philosophy of Action (PHIL 287) [Advanced Philosophy]
   - PHIL 359: Topics in Logic, Information, and Interaction [ASSR]
   - PHIL 388: Topics in Normativity [ASSR]
   - POLISCI 131L: Modern Political Thought: Machiavelli to Marx and Mill (ETHICSOC 131S)
   - PSYCH 160: Seminar on Emotion (PHIL 375G, PSYCH 260) [ASSR]

2. **Formal Decision Theories.** One of the following:
   - ECON 51: Economic Analysis II
   - ECON 136: Market Design
   - ECON 160: Game Theory and Economic Applications
   - ECON 180: Honors Game Theory
   - ECON 182: Honors Market Design
   - ECON 289: Advanced Topics in Game Theory and Information Economics
3. **Empirical Findings and Explanations.** One of the following:
   - BIO 150: Human Behavioral Biology (BIO 250, HUMBIO 160) [*Cognition Language & Neuroscience*]
   - ECON 178: Behavioral Economics [*Cross-Area Requirement*]
   - ECON 179: Experimental Economics
   - ECON 279: Behavioral and Experimental Economics II
   - EDUC 375A: Seminar on Organizational Theory (MS&E 389, SOC 363A)
   - GSBGEN 646: Behavioral Decision Making
   - LAW 333: Judgment and Decision-Making
   - POLISCI 123: Politics and Public Policy (PUBLPOL 101, PUBLPOL 201)
   - POLISCI 351B: Economic Analysis of Political Institutions
   - POLISCI 351C: Testing Models of Governmental Decision-Making (POLECON 682)
   - PSYCH 154: Judgment and Decision-Making [*Cognition Language & Neuroscience*]
   - PSYCH 160: Seminar on Emotion (PHIL 375G, PSYCH 260) [ASSR]
   - PSYCH 205: Foundations of Cognition
   - PSYCH 212: Social Psychology
   - PSYCH 215: Mind, Culture, and Society
   - PSYCH 223: Social Norms (OB 630)
   - PSYCH 232: Brain and Decision [ASSR]
   - PSYCH 254: Affective Neuroscience [ASSR]
   - PUBLPOL 102: Organizations and Public Policy (PUBLPOL 202)
   - SOC 114: Economic Sociology (SOC 214)
   - SOC 115: Topics in Economic Sociology (SOC 315)
   - SOC 126: Introduction to Social Networks (SOC 226)
   - SYMSYS 203: Cognitive Science Perspectives on Humanity and Well-Being [ASSR]

4. **Methods and Applications.** A course on methods that can be used to study decision making and rationality, or ways to apply research in decision sciences. For example, one of the following:
   - BIOMEDIN 251: Outcomes Analysis (HRP 252)
○ CEE 146A: Engineering Economy (CEE 246A)
○ CEE 206: Decision Analysis for Civil and Environmental Engineers
○ COMM 106: Communication Research Methods (COMM 206)
○ CS 29N: Computational Decision Making
○ CS 181: Computers, Ethics, and Public Policy [Cross-Area Requirement]
○ CS 182: Ethics, Public Policy, and Technological Change (COMM 180, ETHICSOC 182, PHIL 82, POLISCI 182, PUBLPOL 182) [Introductory Philosophy, Cross-Area Requirement]
○ CS 228: Probabilistic Graphical Models: Principles and Techniques
○ CS 234: Reinforcement Learning
○ CS 238: Decision Making Under Uncertainty (AA 228) [Cross-Area Requirement]
○ CS 239: Advanced Topics in Sequential Decision Making (AA 229)
○ CS 261: Optimization and Algorithmic Paradigms
○ CS 325B: Data for Sustainable Development (EARTH SYS 162, EARTH SYS 262) [ASSR]
○ ECON 50: Economic Analysis I
○ ECON 102B: Introduction to Econometrics
○ ECON 102C: Advanced Topics in Econometrics
○ ECON 135: Finance for Non-MBAs (MS&E 245G)
○ ECON 136: Market Design
○ ECON 137: Decision Modeling and Information
○ ECON 141: Public Finance and Fiscal Policy (PUBLPOL 107)
○ ECON 150: Economic Policy Analysis (PUBLPOL 104, PUBLPOL 204)
○ ECON 155: Environmental Economics and Policy
○ ECON 162: Games Developing Nations Play (POLISCI 247A, POLISCI 347A)
○ ECON 181: Honors Information and Incentives
○ ECON 182: Honors Market Design
○ ECON 288: Computational Economics
○ EDUC 247: Moral Education
○ ENGR 62: Introduction to Optimization (MS&E 111)
○ IPS 207A: Problem Solving and Decision Making for Public Policy and Social Change (PUBLPOL 305A)
○ MS&E 121: Introduction to Stochastic Modeling
○ MS&E 152: Introduction to Decision Analysis (MS&E 152W)
○ MS&E 180: Organizations: Theory and Management
○ MS&E 189: Social Networks - Theory, Methods, and Applications
○ MS&E 231: Introduction to Computational Social Science (SOC 278)
○ MS&E 250A: Engineering Risk Analysis
○ MS&E 250B: Project Course in Engineering Risk Analysis
○ MS&E 251: Stochastic Decision Models (EE 365)
○ MS&E 252: Decision Analysis I: Foundations of Decision Analysis
○ MS&E 332: Topics in Social Algorithms
○ MS&E 352: Decision Analysis II: Professional Decision Analysis
- MS&E 353: Decision Analysis III: Frontiers of Decision Analysis
- MS&E 355: Influence Diagrams and Probabilistic Networks
- PHIL 49: Survey of Formal Methods [Introductory Philosophy]
- PHIL 73: Collective Action Problems: Ethics, Politics, & Culture (ETHICSOC 180M, POLISCI 131A, PUBLPOL 304A) [Introductory Philosophy]
- POLISCI 153: Thinking Strategically (POLISCI 354)
- PSYCH 152: Mediation for Dispute Resolution (EDUC 131)
- PSYCH 251: Experimental Methods (SYMSYS 195E) [Practicum, Integrative Requirement]
- PSYCH 253: Advanced Statistical Modeling [Cross-Area Requirement]
- STATS 200: Introduction to Statistical Inference
- STATS 211: Meta-research: Appraising Research Findings, Bias, and Meta-analysis (HRP 206, MED 206)
- STATS 217: Introduction to Stochastic Processes
- STATS 218: Introduction to Stochastic Processes
- STATS 263: Design of Experiments (STATS 363)
- STATS 310A: Theory of Probability (MATH 230A)
- STATS 310B: Theory of Probability (MATH 230B)
- STATS 310C: Theory of Probability (MATH 230C)
- SYMSYS 195B: Design for Behavior Change (CS 247B) [Practicum, Integrative Requirement]
- SYMSYS 195D: Research in Digital Democracy (SYMSYS 295D) [ASSR, Practicum, Integrative Requirement]
- SYMSYS 201: ICT, Society, and Democracy [ASSR]
- URBANST 132: Concepts and Analytic Skills for the Social Sector

5. Integrative Requirement. Must be completed no earlier than the Junior Year:
   - Any of the Standard Options for all Concentrations specified under the Core Capstone requirement, or
   - A Concentration-Specific Integrative Course -- a course that integrates the themes of the Concentration with the Core requirements. One of the following [with more options to be added as they are approved -- some options may be removed if they are included in the list of SYMSYS 195* project courses, in order to avoid redundancy with the Standard Options]:
     - CS 181: Computers, Ethics, and Public Policy [Cross-Area Requirement]
     - CS 182: Ethics, Public Policy, and Technological Change (COMM 180, ETHICSOC 182, PHIL 82, POLISCI 182, PUBLPOL 182) [Introductory Philosophy, Cross-Area Requirement]
     - CS 228: Probabilistic Graphical Models: Principles and Techniques
     - CS 234: Reinforcement Learning
     - CS 238: Decision Making Under Uncertainty (AA 228) [Cross-Area Requirement]
     - CS 239: Advanced Topics in Sequential Decision Making (AA 229)
CS 261: Optimization and Algorithmic Paradigms
CS 325B: Data for Sustainable Development (EARTHSYS 162, EARTHSYS 262) [ASSR]
PHIL 184: Formal and Informal Epistemology (PHIL 284) [Advanced Philosophy]
PHIL 187: Philosophy of Action (PHIL 287) [Advanced Philosophy]
PHIL 359: Topics in Logic, Information, and Interaction [ASSR]
PSYCH 154: Judgment and Decision-Making [Cognition Language & Neuroscience]
PSYCH 160: Seminar on Emotion (PHIL 375G, PSYCH 260) [ASSR]
PSYCH 223: Social Norms (OB 630)
PSYCH 232: Brain and Decision [ASSR]
PSYCH 254: Affective Neuroscience [ASSR]
SYMSYS 201: ICT, Society, and Democracy [ASSR]
SYMSYS 203: Cognitive Science Perspectives on Humanity and Well-Being [ASSR]

6. **Contingent Electives.** If any of requirements 1-5 are fulfilled with courses taken for Core requirements, then additional approved Contingent Elective courses must be completed to total 5 courses beyond those that are taken for the Core. These electives can be one or more courses from any of the areas above, or which are approved for a Core requirement that the student has fulfilled with a different course, or any of the following:
   - More courses may be added here as they are approved.