<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Homework</th>
<th>Project</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 13</td>
<td>Welcome! Introduction and history of AI, Intelligent agents, systems, and robots. Class structures, lectures, readings, homework, projects, exams, grades</td>
<td>AIMA1, AIMA2 (ALFE-1)</td>
<td></td>
<td>Project-1 out: Robot moves!</td>
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<td>Jan 15</td>
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<td>2</td>
<td>Jan 20</td>
<td>Problem Solving, Search, and Optimization Problems Representations, goals, and various search algorithms Description of three projects. Project 1 handout</td>
<td>AIMA3, AIMA4 (ALFE-2.6)</td>
<td>HW1, Encode State Space</td>
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<td>Jan 22</td>
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<td>3</td>
<td>Jan 27</td>
<td>Game Playing and Constrain Satisfactions Representations and algorithms</td>
<td>AIMA5, AIMA6</td>
<td>HW2: Search</td>
<td>Project-1 due</td>
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<td>Jan 29</td>
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<td>4</td>
<td>Feb 3</td>
<td>Logical Representations and Reasoning First-order logic and inferences, and systems</td>
<td>AIMA7, AIMA8, AIMA9</td>
<td>HW3: Logic</td>
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<td>Feb 5</td>
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<td>5</td>
<td>Feb 10</td>
<td>Intelligent Actions, Planning, and Robotics Planning and scheduling. General model of robotics, description and handout for Project 2</td>
<td>AIMA10, AIMA11 (ALFE-3, 6.1)</td>
<td>HW4: Planning</td>
<td>Project-2 out: Robot search!</td>
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<td>Feb 12</td>
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<td>6</td>
<td>Feb 17</td>
<td>Knowledge representations and model representations Logics and probabilities. Knowledge bases, Expert systems, Action models.</td>
<td>AIMA 12 (ALFE-4)</td>
<td>HW5: Game playing</td>
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<td>Feb 19</td>
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<td>7</td>
<td>Feb 24</td>
<td>Uncertain Knowledge and Reasoning Uncertainty, Probabilistic Representation &amp; Reasoning. Bayesian Networks</td>
<td>AIMA13-14 (ALFE-4)</td>
<td>HW6: Probability</td>
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<td>Feb 26</td>
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<td>8</td>
<td>Mar 2</td>
<td>Probabilistic Reasoning over time: Temporal models, Hidden Markov Models, Kalman filters, Dynamic Bayesian Networks, Automata theory Review for midterm exam</td>
<td>AIMA15 (ALFE-5.10)</td>
<td>HW7: BN HMM, FSA</td>
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<td>Mar 4</td>
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<td>9</td>
<td>Mar 9</td>
<td>Midterm Close-book Exam (all materials above) – in class Utility Theories, functions, decision networks Sequential decision making, Policies, MDP, PO-MDP, Multiagent decisions</td>
<td>AIMA 16-17 (ALFE 5)</td>
<td>HW8: POMOP</td>
<td>Project-2 due: Robot learns!</td>
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<td>10</td>
<td>Mar 16</td>
<td>Spring Break (no class)</td>
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<td>Mar 18</td>
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<td>11</td>
<td>Mar 23</td>
<td>Attribute-Based Learning: Forms of learning, Model selection, Supervised Learning of Decision Trees, PAC learning, Decision Lists, Supervised learning: Neural Networks, Support Vector Machines, Ensemble and boost</td>
<td>AIMA18 (ALFE 4.1-5)</td>
<td>HW9: DT, NN, SVMs</td>
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<td>Mar 25</td>
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<td>12</td>
<td>Mar 30</td>
<td>Relation-Based Learning: Motivations, challenges, and algorithms. Inductive logic programing, Complementary Discrimination Learning</td>
<td>AIMA 19 (ALFE4-10)</td>
<td>HW10: NN, CDL</td>
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<td>13</td>
<td>Apr 6</td>
<td>Probability-Based Learning: Probabilistic Models, Naive Bayes Models, EM algorithm, Reinforcement Learning</td>
<td>AIMA 20-21 (ALFE-5.10)</td>
<td>HW11: RF, NBM, EM</td>
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<td>Apr 8</td>
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<td>14</td>
<td>Apr 13</td>
<td>Surprise-Based Learning (guest lecture by Dr. Nadeesha Ranasinghe) Integrated Perception, Action, Problem Solving, and Learning. The challenge of vision and object/people/activity recognition, and robotic applications.</td>
<td>AIMA 24 (ALFE-7-12)</td>
<td>HW12: SBL, Final exam questions out</td>
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<td>15</td>
<td>Apr 20</td>
<td>Introduction to Communication (Natural Language Processing), Collaboration, Self-organization, and Self-reconfiguration</td>
<td>AIMA22-23 Handout</td>
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<td>Apr 22</td>
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<td>17</td>
<td>May 6?</td>
<td>Time: Final Close-book Exam (materials of entire semester) – in class</td>
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<td>Final Exam</td>
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Project 1: Design and implement a simple robot Rx to move from point A to point B in an open environment.
Project 2: Give Rx intelligence so that it can search and navigate a path from point A to point B in a crowded environment.
Project 3: Make Rx learn from its own experience so that it can find a target in its environment.
Extra-Credit: Make Rx reconfigure or transform itself in order to solve problems in Project 2 and Project 3.

Grade Structure: Midterm: 30%, Final: 30%, Project-1: 5%, Project-2: 10%, Project-3: 15%, Interaction (Quiz) in Class: 10%. Late Project Penalty: -30% of the project grade for each day that is late.