**Masters of Science Artificial Intelligence  
Program Outline**

**Major Requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Prefix** | **Number** | **Course Title** | **Credit Hours** |
| CSC | 702 | Mathematics of A.I. | 3 |
| CSC | 722 | Machine Learning | 3 |
| CSC | 726 | Neural Networks | 3 |
| CSC | 727 | Applications and Ethics of A.I. | 3 |
| CSC | 789 | A.I. Capstone | 3 |
|  |  | Subtotal | 15 |

**Major Electives:** **List courses available as electives in the program. Indicate any proposed new courses added specifically for the major.**

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| --- | --- | --- | --- |
| **Prefix** | **Number** | **Course Title**  *(add or delete rows as needed)* | **Credit Hours** |
| Courses from approved course list from CSC (including CSC 761), BADM, CET, HIMS, INFA, INFS, LT, MATH, STAT | | | 15 |
| CSC | 761 | Advanced Artificial Intelligence |  |
|  |  | Subtotal | 15 |

**CSC 702 Mathematics of A.I.**  
This course is a comprehensive study of the mathematics and statistics that serve as the cornerstone of modern Artificial Intelligence algorithms. This will allow students to gain a deeper understanding of the concepts, algorithms, models, and techniques that drive A.I. Topics come from different fields, such as linear algebra, calculus, probability theory, graph theory, and optimization. Prerequisites: CSC 402/502 Mathematical Foundations of Artificial Intelligence or equivalent.

**CSC 722 Machine Learning**

A comprehensive study of the theory and the implementation of principle machine learning algorithms. Topics include supervised and unsupervised learning methods for classification, prediction, and decision-making.

**CSC 726 Neural Networks**This course provides an in-depth look at deep learning architectures, methodologies, and mathematics to help students understand their proper application. Architectures studied include multilayer perceptron, convolutional neural networks, recurrent neural networks, and transformers. Applications for each type of architecture will be discussed, including transfer learning, reinforcement learning, generative and adversarial models, and computer vision.

**CSC 727 Professional Application and Ethics of A.I.**  
This course will study the practical solutions of A.I. in professional settings with an emphasis on ethical considerations, societal impact, and responsible development. Students will explore case studies, develop strategies for integrating A.I. that align with industry standards and societal values, and engage in ethical decisions. Topics include ethical frameworks in A.I., legal and regulatory considerations, fairness, bias, accountability, transparency, and human centered A.I. design.

**CSC 789 A.I Capstone**In this course students will work individually or in small teams to tackle significant A.I. challenges to demonstrate their mastery of advanced A.I. concepts and assess their ability to develop innovative solutions. It is intended to serve as the culmination of the MSAI program.

**CSC 761 Advanced Artificial Intelligence**   
The objective of this course is to provide students with a background in advanced artificial intelligence problem solving methods. Topics covered include: Expert systems, fuzzy logic and fuzzy expert systems, genetic algorithms, case-based reasoning, and current research work on new areas of problem solving.