

Artificial Intelligence and Data Science (AIDA)

AIDA 100 Intro to AI**3.0 SH****[GESN]**

Coverage of modern artificial intelligence, including history, present state and possible future of AI; practical use of AI in creative and intellectual work; social, philosophical and ethical issues in AI; and mathematics and algorithms of AI.

Prerequisite: Success in this course depends upon students having successfully completed the equivalent of two years of high school algebra and one year of high school geometry with grades of C or above.

AIDA 342 Machine Learning I**4.0 SH****[]**

Mathematics and software design of machine learning systems, including analytical and generative applications. Deep learning, including CNNs, transformers, VAEs, and reinforcement learning. Non deep-learning algorithms such as support vector machines and decision trees. Students will build and train a machine learning system.

Prerequisite: C or better in CSCI 171, CSCI 182, CSCI 220, and CSCI 240. MATH 273 and MATH 366 are also required.

Class Level Restriction: Sophomore and Junior and Senior only.

AIDA 344 Data Science I**4.0 SH****[]**

Theoretical and practical aspects of the analysis and display of very large datasets, including data types and data cleaning, classic statistical methods like correlation, unsupervised learning methods like K-means and other clustering, itemset analysis, sequence analysis, Bayesian analysis and other methods. Students will write code for analysis and display.

Prerequisite: C or better in CSCI 171, CSCI 182, CSCI 220, and CSCI 240. MATH 273 and MATH 366 also required.

Class Level Restriction: Junior and Senior only.

AIDA 352 Machine Learning II**3.0 SH****[]**

Advanced theoretical topics in AI, including deep learning initialization and activation functions, theoretical analysis of deep learning training, alternative function approximators such as KANs, NeRFs and 3-D learning, and a deep look at reinforcement learning.

Prerequisite: AIDA 342.

AIDA 354 Data Science II**3.0 SH****[]**

Advanced algorithms and methods in Data Science, including graph and network analysis, causal calculus, and dimensional reduction.

Prerequisite: AIDA 344.

AIDA 382 AI & Data Science Practicum**4.0 SH****[]**

Application of Data Science and AI to the solution of practical problems, with emphasis on software engineering and project management. Students will identify a currently unsolved problem in data analysis or pattern recognition of interest to a customer and will implement a solution using appropriate methods and algorithms.

Prerequisite: AIDA 342 and AIDA 344.