Computer Science (BS) with an Emphasis in Machine Learning

This program is offered by the George Herbert Walker School of Business and Technology/Computer and Information Sciences Department. It is available at the St. Louis main campus.

Program Description

Artificial Intelligence (AI) is a rapidly-evolving branch of Computer Science focusing on analyzing data, and making appropriate and effective decisions based on this analysis. A foundation of Artificial Intelligence and Machine Learning will be provided. The Python programming language will be introduced and used to resolve Machine Learning-related questions. An understanding of ways in which Machine Learning can provide support to multiple disciplines will be introduced.

Learning Outcomes

Upon completion of the program, students will be able to:

- Demonstrate mastery of computer science in the following core knowledge areas:
  - Software development.
  - Algorithms and data structures.
  - Computer organization, hardware, and architecture.
  - Data and information management.
- Describe how technological advances impact social issues and professional practice.
- Write and orally communicate technical material effectively and professionally.
- Apply problem-solving skills and the knowledge of computer science to solve problems.

Emphasis Specific Learning Objectives

Upon completion of the program students will be able to:

- Explain the fundamental aspects of Artificial Intelligence and the potential benefits to companies and organizations.
- Utilize a programming language to manage Machine Learning techniques.
- Develop Machine Learning techniques and algorithms to resolve Artificial Intelligence problems in different areas of industry.

Degree Requirements

For information on the general requirements for a degree, see Baccalaureate Degree Requirements under the Academic Policies and Information section of this catalog.

- 60 required credit hours
- Applicable University Global Citizenship Program hours
- Electives

At least 30 of the required 60 hours must be taken at Webster University.

All upper-level (3000 and above) courses must be taken at Webster University. All artificial intelligence courses must be taken at Webster University.

Required Courses

- COSC 1550 Computer Programming I (3 hours)
- COSC 1560 Computer Programming II (3 hours)
- COSC 1570 Math for Computer Science (3 hours)
- COSC 2610 Operating Systems (3 hours)
- COSC 2670 Network Principles (3 hours)
- COSC 2710 Social Engineering and Society (3 hours)
- COSC 2810 Systems Analysis and Design (3 hours)
- COSC 3050 Data Structures I (3 hours)
- COSC 3100 Data Structures II (3 hours)
- COSC 3230 Human-Computer Interaction (3 hours)
- COSC 3410 Computer and Information Security (3 hours)
- COSC 3510 Computer Architecture (3 hours)
- COSC 4110 Database Concepts (3 hours)
- COSC 4120 Database Applications (3 hours)
- MATH 2410 Discrete Mathematics (3 hours)

Emphasis Specific Required Courses

- CSAI 3210 Introduction to Artificial Intelligence (3 hours)
- CSAI 3220 Foundations of Machine Learning (3 hours)
- CSAI 4210 Machine Learning Methods (3 hours)
- CSAI 4220 Neural Networks (3 hours)
- CSAI 4230 Deep Learning (3 hours)

Majors